

RIDICULOUSLY SIMPLE METHOD TO MASTERING
PMP® EARNED VALUE MANAGEMENT

EVM MADE

EASY

LEARN THE TEMPLATE • FOLLOW THE PROCESS

Ace EVM Questions

SCOTT PAYNE

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"Your EVM way, it's the funkiest thing ever, but there were 5 EVM questions on my exam and I know for a FACT that I got EVERY ONE of them RIGHT.

It's like plug and play!"

LAUREN S.
(SHE ACED THE PMP)

**Just Say
No...
To the
Data
Dump**

THIS IS WHY YOU THINK EVM IS HARD!

If you are reading this book, ***you WANT to get every EVM question correct on the PMP exam***, but there is a strong chance that you currently don't feel confident in your ability to achieve that goal.

You're in luck because I have created a ridiculously simple and insanely effective method that will instantly allow you to master ANY and EVERY Earned Value Management question you face on the PMP exam.

***Everyone thinks EVM questions are hard, but
I will PROVE to you that they are EASY!***

My name is Scott Payne and I have been in your place. When I was studying for the PMP exam, I tried the traditional memorization and data dump method of solving EVM questions and it wasn't working for me. I spent hour after hour memorizing the formulas and practicing a data dump, but too often I made some random mistake that caused me to get the question wrong. Worst of all, the time and stress of memorizing and regurgitating formulas kept me from learning other important PMP topics.

***It was obvious that memorizing wasn't the answer,
but I didn't know what to do.***

What I did know was that ***I had to find a simpler way***. One that would be flexible enough to help me get any type of EVM question correct, yet simple and easy enough to use that I wouldn't have to stress over my ability to perform during the exam.

For weeks I searched, spending night after night thinking long and hard about what was actually keeping me from consistently solving these questions. Late one night, it hit me. Actually, four things hit me.

***I uncovered 4 secrets that instantly changed
the way I looked at and solved EVM questions.***

These four secrets made it shockingly clear to me that ***it was my approach and process*** for solving EVM questions, through memorization and a data dump, that ***was wrong***. These secrets paved a path for a different way to solve these questions.

That same night, in a flash (it literally took 30 minutes), I created the EVM question-solving template and method that you will learn in this book. Believe me, I was amazed that the template-based method I created worked. I tested and tested it and it always worked. In no time, I went from stressing about EVM questions to loving them. Best of all, when I walked into the PMP exam, I was confident and able to ace every EVM question. You will, too!

Knowing the four EVM secrets and succeeding on the exam was not enough. After the exam, it became my quest to find a way to teach my template and method to everyone. It made sense in my head, but I had to find a way to quickly and easily explain it to anyone. Pursuing this goal, I created, tested, and refined a PROVEN process to teach any student to master EVM questions. This is what you will learn in this book.

***You will get every EVM question right on the exam,
when you follow the simple method I created.***

My method is more than a template. It is a **logical and easy-to-use question-solving process**. My process provides everything that the traditional way of teaching EVM concepts fails to deliver. While the traditional way relies on memorization, my method makes you stronger and more prepared for the exam by building your question-solving skills and flexibility through the use of a guided learning process.

After teaching thousands of students, I have learned that...

***It is my unique GUIDED approach to
decoding Earned Value Management questions that really matters.***

Just as my EVM question-solving method follows a process, my approach to teaching you follows a process. This book is designed to methodically **build your skills until you are an EVM question-solving ninja**. It's not rocket science, but it does require discipline.

My process starts by ensuring you have a strong foundational understanding of EVM terms and concepts and it culminates in teaching you how to **Understand, Create (the template), and Dominate** every EVM question using my simple **EVM question-solving template and process** during your exam.

We WILL do this together. You and me. Let's get started.

A handwritten signature in black ink that reads "Scott Payne". The signature is written in a cursive, flowing style.

Just 4 Secrets...

**Stand
between
YOU and
EVM success**

4 SECRETS KEEPING YOU FROM EVM MASTERY

Before you learn my template and question-solving process, it is essential that you learn the four secrets that are keeping you from EVM mastery.

Learning these secrets will transform how you think and solve EVM questions and will prove to you that the traditional EVM question-solving approach is not only *not* helping you, but it is actually holding you back.

EVM Secret #1:

***Thoughtless memorizing of EVM equations puts you at a
GREATER RISK to get EVM questions WRONG.***

I want you to “Just say no to the data dump”! The data dump is the first step in the traditional EVM approach. Countless students have been told that the best way to prepare for EVM questions is to memorize all of the EVM equations and pray that you can quickly write them down, as soon as possible, on the scratch paper provided in the exam. I am here to tell you that thoughtlessly memorizing these is a waste of your time.

Memorizing these equations is difficult and doesn’t help you learn what the equations really mean, much less when they should be used. Worst of all, it is easy to make mistakes when you are regurgitating equations in this way. This fact should make you shiver, because ***incorrectly remembering one value*** for any EVM equation ***could cause you to miss every EVM question***. The reason for this is easily explained by EVM Secret #2.

EVM Secret #2:

***Nearly ALL EVM questions require that
you use MULTIPLE EQUATIONS.***

Don’t believe me? Let’s walk through a common EVM question scenario. Take the example of a question asking you to calculate the Estimate at Completion (EAC) of a certain project. Sounds easy enough, and you think all you need to do is remember or find the equation for EAC. You reach back in your brain or on your data dump sheet and find the equation for EAC ($EAC = BAC / CPI$). As you fill in the variables, you realize that while the question did state the BAC (that’s the budget at completion), you can’t find the CPI value. Darn!

After wasting two minutes searching through the question again, hoping to find the missing value, you realize that YOU now have to calculate CPI. This starts the equation memory search process all over again. Once you have the CPI equation in mind ($CPI = EV / AC$), you again reread the question praying that you have everything you need to solve the CPI equation so that you can THEN solve the original EAC equation. Unfortunately, those pesky EVM question writers have disappointed you AGAIN! You have the value for AC, but they didn’t expressly state an EV value (that stands for Earned Value). That reality forces you to find a way to infer the EV value from the description within the question. ***Only then*** do you have the raw materials you need to solve for the CPI value and then for EAC.

As you see, a question that looks simple, such as “What’s the EAC?,” actually requires you to use THREE equations that each build on each other. ***More equations present more opportunities to make mistakes and waste your precious time.***

EVM Secret #3:

Blindly searching for the right equation is the WRONG APPROACH to solving EVM questions.

We now realize that nearly all EVM questions require the use of multiple equations and that thoughtlessly memorizing equations puts you at GREATER risk to make mistakes. Let me ask you two quick questions:

- ***Does it sound FUN to blindly search for the perfect mix of equations on every EVM question?***
- ***In 1 minute and 12 seconds, could you do the mental gymnastics I described in EVM Secret #2?***

The reality of the data dump is that even if you are successful in documenting the equations, they are most likely in random order on your data dump sheet. Each EVM question will ask you to solve for a different variable and each will provide a different mix of information that you can use. ***It is mentally taxing and a drain on your time to search for the exactly correct mix of equations*** to use in exactly the correct order.

The cold hard reality is that every time you encounter an EVM question, you will be starting from zero.

Having a mass of equations scribbled on your scratch paper will force you to waste valuable time and effort attempting to put together the perfect mix of required equations. Sometimes you may get lucky, but most times you will get frustrated. Your time is better utilized solving other questions on the exam. To free up that time, you need a simple and repeatable question-solving process.

EVM Secret #4:

Following a path makes it EASIER to solve questions.

Whew! The process described in Secret #2 was exhausting. Imagine doing that four to eight times on the exam. The reason why it was so hard was that **we approached the question from the wrong direction**. I refer to this as “*Struggling from the Bottom Up,*” instead of “*Flowing from the Top Down.*” Flowing from the top down is way easier!

To help you picture this, let’s think about what actually happened in the Secret #2 example. Our approach started at the bottom with the ultimate thing we needed to calculate (the EAC value is what the question asked for), but unfortunately everything we needed for that equation wasn’t available.

We had to FIGHT our way back up to find the variables needed. Multiple times. This is against the natural logical flow of the equations. We struggled through this tiresome process of mental gymnastics until we had everything we needed ONLY to have to spend more time coming back down and using the values we just calculated. Our path kind of looked like a horse shoe. However you picture it, it’s wasteful and confusing.

*In contrast, wouldn’t it have been easier if we had known EXACTLY which equations we need at the beginning?
And in a way that each equation cleanly and logically fed the next until we arrived at the correct answer?*

That is exactly what my template does. I designed it to eliminate confusion by **organizing the equations in a logical, flowing structure** that guides you from the provided information directly to the requested answer value. My process flows simply from top to bottom AND it’s the same process every time.

No mental gymnastics, no frustration, JUST the correct answer.

WHY EVM QUESTIONS MATTER

Of the two hundred questions on the PMP exam, you can expect to **encounter four to eight Earned Value Management questions**. You may be asking yourself, if EVM questions only account for two to four percent of the entire exam, why should I worry about them?

First of all, these eight questions could be the difference between passing and failing the exam. We want those points and I will help you get them! I want you to think of EVM questions as **FREE MONEY**.

Secondly, these few questions can have a **DISPROPORTIONATE IMPACT** on your performance on the rest of the PMP exam. More specifically, I am referring to the negative impact they can have on your **time management and stress level**.

In terms of time, the unprepared student will spend an exorbitant amount of effort during the exam trying to decode EVM questions and recall the exact equations needed. This time and effort greatly detracts from the student's ability to solve the REST of the questions on the exam.

Additionally, a key to conquering the PMP exam is to get into a steady rhythm of solving questions. The best performance is obtained when students achieve a kind of question-answering flow. Getting tripped up unwinding EVM questions can kill flow, ruin your momentum, and drop your score.

***EVM questions matter, not because of their volume,
but because of the TOTAL impact they can have.***

Even worse than the negative impacts to time and flow, EVM questions can also cause undue **STRESS**. I see countless students get thrown off of their PMP game worrying about their ability to solve EVM questions. Their fear keeps them from relaxing, focusing, and succeeding on the rest of the exam. Test day can be stressful and people do freeze up. My method will help you easily remember the EVM equations and correctly solve all of the questions, even if you go blank due to stress.

The truth is, you have two options:

Struggle and Guess, hoping that you get lucky,
or

Learn my Process and get EVERY EVM question correct

When I state it like that, the preferred option seems pretty clear!

Struggling won't help you pass and guessing on any question should only be used as a last resort. The process that I teach you in this book does not force you to have a PhD in project management or statistics, but it does require that you adjust the current approach you have to solving EVM questions. My approach is logical and it will make you an EVM-solving machine.

Let me prove it to you!

MY SIMPLE PROCESS TO SOLVE EVERY EVM QUESTION

Forcing yourself to recall the exact combination of EVM equations to use on a question is difficult and increases your risk of making a mistake. My process consists of a custom worksheet (template) AND using simple three-steps. By using the template and three-steps together, you will standardize the way you approach any and every EVM question and **COMPLETELY ELIMINATE THE RISK** of making a mistake.

My EVM Question-Solving Process is LOGICAL, EASY TO USE, and IT WORKS EVERYTIME!

The following chapters guide you through how to **Understand**, **Create**, and **Dominate** using the template and the simple three-step procedure to answer every EVM question correctly.

The three-steps to solve every EVM question is as follows:

1. **Identify what is asked for**
2. **Define what is given**
3. **Follow the path to the answer (top to bottom)**

Before I teach you how to create and use the template, I need to strengthen your fundamental understanding of Earned Value Management as it relates to the PMP exam.

OPM Master Prep Earned Value Management Template	
BAC	Total budget
PV	Work that <u>should</u> be done
EV	What <u>is</u> done
AC	Actual spend
$SV = EV - PV$	$CV = EV - AC$
$SPI = EV / PV$	$CPI = EV / AC$
	$EAC = BAC / CPI$
	$ETC = EAC - AC$
	$VAC = BAC - EAC$
	$TCPI = (BAC - EV) / (BAC - AC)$

Follow the process.

**Get the
question
right.**

Rinse and repeat.

Understand

Three types of EVM questions

What are EVM questions really asking?

Defining the 12 EVM variables

Feeling the PAIN of EVM

Understanding my EVM template

Letting the template guide the way

Proving the power of my EVM template

3 TYPES OF EVM QUESTIONS ON THE PMP EXAM

You will face three types of EVM questions on the PMP exam:

1. **Calculations**
2. **Value interpretations**
3. **Graph interpretations**

Don't worry, I am going to prepare you to be successful in answering all three types. Before we go into how to answer them, let's start by learning how each type of question is structured and what each type is asking for.

Question Type #1: EVM calculation questions

EVM calculation questions look exactly like the other standard questions on the PMP exam. They provide a detailed description of a project scenario and ask you to calculate an EVM value for a current project condition. This type of question is the most common and most difficult of the three types of EVM questions. This book is primarily focused on helping you answer these type of questions. The great thing is that if you can answer the calculation questions, you can easily answer the other two types of EVM questions, too.

Here's an example of an EVM calculation question:

You are the project manager responsible for the overhaul of six large industrial generators. The entire contract is expected to be completed in four months at a total cost of \$1,000,000. Two months have passed and \$620,000 has been spent and 40% of the work has been completed. What is the estimate to complete for this project?

- a) \$220,000
- b) -\$220,000
- c) \$100,000
- d) -\$100,000

Question Type #2: EVM value interpretation questions

EVM value interpretation questions do not require any calculations. Instead, they provide certain EVM values and ask you to make an assessment of the overall project performance. The key to correctly answering these questions is to understand how to interpret each EVM value. A later section, Defining the EVM Variables, explains the meaning of each EVM variable and how to interpret the values. Once you master these concepts, you will be able to ace this type of question!

Here's an example of an EVM value interpretation question:

You have recently taken over a project in the Executing process group. You have been informed that the project has an SV of \$45,000 and a CV of -\$60,000. These results indicate that the project is in what condition?

- a) Ahead of schedule and under budget
- b) Ahead of schedule and over budget
- c) Behind schedule and under budget
- d) Behind schedule and over budget

Question Type #3: EVM graph interpretation questions

Graph interpretation questions may appear quite different from the other types, but in reality the skills required to answer them are the same skills used in answering value interpretation questions. Graph interpretation questions are asking you the same questions, but they are presenting EVM values in a visual, rather than textual, format.

The graph in this question type serves the same purpose as the written paragraph in an EVM value interpretation question. Remember the saying “A picture is worth a thousand words”? That is exactly what is happening in this type of question.

I need you to understand that the graph is telling you a story.

It is giving you the basic EVM-related data points that you need to answer the question. You use those data points to solve the question.

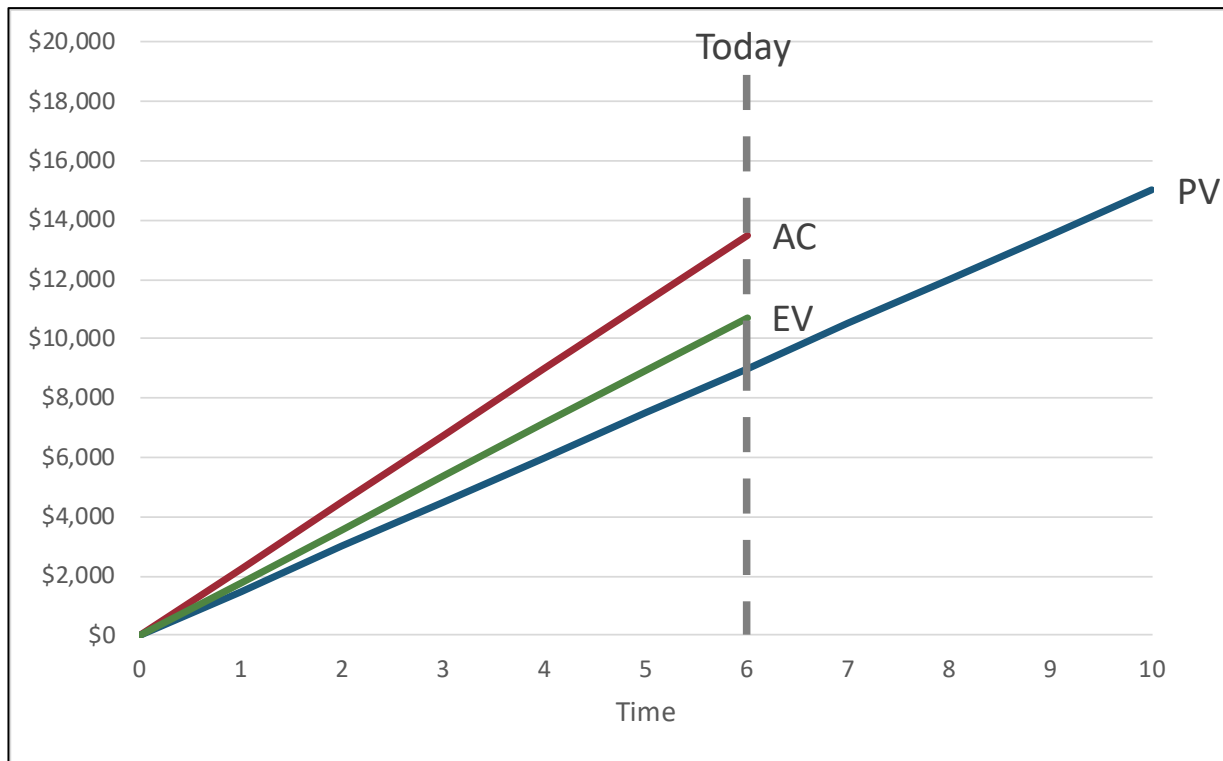
Most graph-based questions ask you to interpret the EVM data displayed on the graph to assess the condition of the project. Your focus is to evaluate the relative position of the EV, AC, and PV values on the graph.

By understanding how to interpret and calculate word-based questions like value interpretation questions, you are preparing yourself to answer every graph-based question as well. You can even use approximations of the graph values to answer graph-based questions.

Here’s an example of an EVM graph interpretation question:

The EVM diagram defines the project performance up to this date. Which of the following answers correctly defines the state of the project?

- a) Ahead of schedule and under budget
- b) Ahead of schedule and over budget
- c) Behind schedule and under budget
- d) Behind schedule and over budget



**Everything
Boils Down to
2 Questions...**

WHAT ARE EVM QUESTIONS REALLY ASKING?

Now that you understand the three question types, we have to build a solid EVM foundational understanding in your mind. Before we move on to solving questions, you must **first understand** what EVM questions ask for and what each individual variable means.

What are EVM questions *REALLY* asking?

Earned Value Management concepts integrate scope, schedule, and cost data to **assess a project's condition** at a specific point in time, right now or in the future. More specifically, EVM questions ask you to use both math and your ability to interpret the values to determine the project's schedule or cost condition.

Regardless of the question type, all EVM questions ask one of the same two questions:

“How has the project performed up to this point?”

or

“How is the project going to perform in the future?”

Don't believe me? I have grouped common queries you will see in your EVM exam questions under each of the two big questions posed above:

- ***“How has the project performed up to this point?”***
 - Is the project under or over budget? (Cost Variance)
 - How efficiently is the budget being spent? (Cost Performance Index)
 - Is the project ahead or behind schedule? (Schedule Variance)
 - How efficiently is the team completing the project work? (Schedule Performance Index)
- ***“How is the project going to perform in the future?”***
 - What is the projected performance at project completion? (Estimate at Completion)
 - How much more do we need to spend? (Estimate to Complete)
 - How much does current performance need to improve to meet our goal? (To-Complete Performance Index)

Let's test my theory further. Ok, think of the definition of cost variance. By definition, which of the 2 big questions would cost variance refer to? Well, cost variance is defined as the amount of budget deficit or surplus that exists at the current moment. So by definition, calculating the cost variance is a way to determine how the project is performing right now, or, in other words, “up to this point.”

Let's try again with Cost Performance Index. Cost Performance Index is defined as a measure of how efficiently resources have been spent. That is clearly a form of the first question, too: “How are we doing up to this point?”

To fully prove my point, let's take the variable ETC, which stands for Estimate to Complete. ETC calculates the expected cost to finish all the remaining work. How often have you been asked by your boss, “How much more are we going to have to spend to finish this project?!” That is precisely what ETC determines, and ETC clearly refers to the “How are we going to do in the future?” question.

Before we move on...

What information do you need to accurately answer either one of the two key questions?

You always need to know the current performance up to this point. How much we have spent, what we have accomplished, where we are on the schedule. With those facts, do we have enough to tell our bosses exactly how we are doing right now/up to this point or in the future?

No, because with only the project's actual cost, schedule, and scope results, we have only one half of the story.

What is MISSING is a *comparison*! The project actuals come alive when we compare them with what we planned to have done at this point in time. The comparison is what brings context to our performance. That is why the three project BASELINES are so important.

To fully answer each of the two key questions, we compare the planned vs actual performance. In fact, making that comparison is what a majority of the activities in the Monitoring and Controlling Process Group are all focused on doing.

As we leave this section, remember that the reason why we are solving these EVM question is to learn more about our projects. Specifically, we are attempting to answer the two key questions. In order to answer these, we not only need to know the actual performance, but we need to know the project baselines for comparison.

You must realize that every variable must be converted to monetary terms.

EVM methodology does a great job of bringing all three key performance baselines together to give an overall assessment of the project's health. The math within the equations does the hard work.

What you need to realize right now is that in order for the equations to calculate properly we must **convert** the planned and actual **scope and schedule performance to a monetary value**. Getting everything in monetary values allows us to do orderly math (apples to apples). We will make those necessary conversions by determining the planned value and earned value. (Don't worry, I will teach you how to do this in the next section.)

This might not hit home yet, but stick with me. Your big take away right now is that you must convert the schedule and scope data into a monetary value.

Data vs. Information (Fact vs. Interpretation)

So where do we get the values that we will use to solve the EVM questions?

To answer the two big EVM questions described above, you need BOTH work performance data and work performance information about the project.

Data and information, aren't those the same thing?

Not really. The difference is in **Fact vs. Interpretation**.

I want you to think of **Work Performance Data as project facts**, stone cold and impartial. These are just numbers that compile the results of what has occurred on the project up to this current moment (what the total budget is, how much has been spent, what work should be done, what work is done). These values provide a record of project progress, but they DO NOT render a judgement on how the project is performing.

Data = facts recording project progress up to the current point
Information = interpretation of project performance and future forecasts

To make that assessment of project performance, you need to compare the data values against a baseline. Anything performing better than the baseline is doing well, and anything behind is performing poorly. There are three baselines in any project: Scope, Cost, and Schedule. The **Work Performance Information values determine the health of the project** by comparing the data values (facts) against the baselines.

**In using the EVM equations,
you are *converting* Work Performance Data
into
Work Performance Information.**

Remember, this is the primary purpose of the entire Monitoring and Controlling Process Group!

Look at the inputs, outputs, and tools and technique table for the Control Cost process shown below. Do you see how the work performance data is an input and work performance information is an output. In between these two, you see that "Earned Value Analysis" is a tool. This pattern of work performance data as an input, work performance information as an output, and data analysis as the primary tool & technique is present in nearly EVERY process in the monitoring and controlling process group. This pattern is how we determine our progress status!

This point is VERY IMPORTANT. This will help SIMPLIFY THE PMP!!! Take a second and let it sink in.

	Inputs	Tools & Techniques	Outputs
7.4 Control Costs	Project management plan	Expert judgement	Work performance information
	<i>Cost management plan</i>	Data analysis	Cost forecasts
	<i>Cost baseline</i>	<i>Earned value analysis</i>	Change requests
	<i>Performance measurement baseline</i>	<i>Variance analysis</i>	Project management plan updates
	Project documents	<i>Trend analysis</i>	<i>Cost management plan</i>
	<i>Lessons learned register</i>	<i>Reserve analysis</i>	<i>Cost baseline</i>
Project funding requirements	To-complete performance index	<i>Performance measurement baseline</i>	
Work performance data	Project management information system	Project documents updates	
Organizational process assets		<i>Assumption log</i>	
		<i>Basis of estimates</i>	
		<i>Cost estimates</i>	
		<i>Lessons learned register</i>	
		<i>Risk register</i>	

Quick Knowledge Check #1

All EVM questions ask one of two questions, what are they?

- _____ ?
- _____ ?

EVM equations help answer these questions by comparing _____ performance with the _____.

Visualize the transformation: Insert the missing words



DEFINING THE 12 EVM VARIABLES

Enough theory, let's get into the details. There are **twelve key variables** that you must know to solve EVM questions. The PMP exam contains questions that ask you to calculate and/or interpret any of these twelve values. You must have an understanding of what each means and know how to interpret them.

The values are broken up into two groups: Work Performance Data and Work Performance Information. Do you remember the difference between Fact (Data) vs Interpretation (Information)?

The Work Performance Data group contains four of the twelve variables.

The remaining eight variables in the project Work Performance Information group will allow you to interpret the project's current performance or forecast future performance.

Work Performance Data:

The **Work Performance Data** variables define the current and planned performance at the current time. Remember, these variables support no interpretation of whether or not the values are good or bad. *They are just impartial facts:*

1. **Budget at Completion (BAC)**
 - Total budget amount allocated for the project
2. **Planned Value (PV)**
 - Value of the work that **should be** done
 - Creates the standard by which progress will be measured
3. **Earned Value (EV)**
 - Value of the work that **is** done
 - Often used to calculate the project's percent complete
4. **Actual Cost (AC)**
 - **Actual** amount spent to complete the work up to this point

Make sure you understand the difference between Planned Value and Earned Value:

Two of the four variables, Budget at Completion (BAC) and Actual Cost (AC) are straight forward. BAC is the total amount allocated to the project and AC is the total amount that has been spent up to day.

Before we go further, **I want to make sure you have a solid understanding of Planned Value and Earned Value.** Many students have difficulty distinguishing between these two variables.

Being able to infer the planned and earned values from given information is an important skill that you will have to use to solve EVM questions. I will teach you how to do this later. What I need you to do RIGHT NOW is to dive down and ensure you are confident in this simple relationship:

Planned Value is the value of the work that SHOULD be done and Earned Value is value of the work that IS done.

I created a simple story approach to help you remember the difference between PV and EV.

Imagine there are two different people who work on a project.

The first person is a man. **Let's call him Mr. PV.**

Mr. PV's only job on the project is to show up to a closed room and stare at the project schedule and the clock on the wall. He never leaves the room and the room has no windows. All he does is watch the clock tick and look at the official schedule. In fact, he has no concept or care for the actual work and he never goes to see the actual project work being completed. **Mr. PV ONLY worries about how much of the project schedule time has elapsed.**

I want you to picture this person in your mind. Can you see him?

If you were to be ask Mr. PV how the project is performing, he would tell you that "We are 25% into the total schedule and we should be done with a quarter of the project work." **Mr. PV's perspective is valuable, but it only gives one side of the full story.** He can only tell you about the value of the work that **SHOULD be done at this point in time.**

Now I want you to picture another, totally different person. **Let's call her Ms. EV.**

Ms. EV never comes into Mr. PV's closed room and instead spends all of her time on the project work site. She knows every detail of what is actually happening and efficiently and manages the completion of the work. When asked how the project is performing, she confidently responds that "We have completed thirteen major deliverables and that is worth two million dollars. The team is working hard and we are solving every problem we face." **Remember that Ms. EV has a totally different perspective than Mr. PV.** She tells you the **exact value of everything her team has ACTUALLY completed.**

To solve EVM questions, you will have to infer the PV and EV values. To do this, remember each character and...

Ask yourself, "What would Mr. PV say?" then "What would Ms. EV say?"

Mr. PV

Ms. EV

Mrs. AC

**What do they
look like in
your mind?**

How a conversation between Mr. PV, Ms. EV, and Mrs. AC define a project's status:

You should realize that both Mr. PV's and Ms. EV's data are important, but alone they don't provide the perspective you need to truly understand the project's condition. What we need to do is to compare all four Work Performance Data points in various ways (by using the EVM equations) to get Work Performance Information!

I want you to see each equation as a conversation.

The equations to calculate work performance information use work performance data as the raw materials in various arrangements. I will explain each equation in depth, but let's use the Mr. PV and Ms. PV example to show you how we can learn by comparing the variables in a conversational way.

What would we learn if Mr. PV and Ms. EV had a conversation? Let's listen in on how this conversation might go.

Mr. PV would say, "we are 25% into the total schedule and we should be done with a quarter of the project work."

Ms. EV would respond, "We have actually completed 13 major deliverables and that is worth 2 million dollars."

Comparing notes Ms. EV asks, "So Mr. PV on your schedule how many deliverables should I be done with right now?"

Mr. PV promptly responds, "As of today, my schedule shows you should be done with 12 deliverables, worth 1.8 million dollars."

Each would smile as they quickly realize that the amount that is "actually" done is more than what "should be done". Both would race to proclaim, "we are ahead of schedule!"

This simple conversation and comparison of EV to PV is what is happening in the equation for Schedule Variance ($SV = EV - PV$). Replacing the variables with words we can see the comparison come alive!

What can we learn by comparing Actual Cost?

Through one simple conversation between Mr. PV and Ms. EV we have learned that the project is ahead of schedule. That is great, but what critical project data point is missing? Cost! Think about why understanding cost matters. The project is ahead of schedule, but we have no idea what was spent to complete the work.

Mrs. AC must be included in the conversation.

While Mr. PV and Ms. EV continue to chat a new character named Mrs. AC introduces herself. As the lead accountant at the company, Mrs. AC has seen project managers come and go. She knows that the best performing project managers know and manage their costs aggressively! For that reason she politely interjects.

"Nice to meet you both, Mr. PV and Ms. EV. My name is Mrs. AC and I wanted to help add some detail to your conversation. I overheard you talking and it's great that we are ahead of schedule." Mrs. AC pauses, shifting her glance to Ms. EV and asks, "Do you know how much you have spent to get the work done?"

Without waiting for an answer, Mrs. AC continues, "My records show that to complete the 13 deliverables worth \$2 million you have actually spent \$2.3 million. You are racking up tons of overtime as you rush through the work!"

Grateful for the data, Ms. EV responds with a realization. "If I have spent more (AC) than I have produced (EV) then it's clear to me that I am over budget. I better do something about that!" (*The conversation between Ms. EV and Mrs. AC is what is happening when you calculate Cost Variance using the equation $CV = EV - AC$.*)

I hope you now see that you can simplify all EVM equations by replacing the variables with the individuals (and more importantly the perspective they bring)!

Work Performance Information:

At this point it is critical that you understand that the Work Performance Information variables are all calculated using the work performance data values.

The remaining eight **Work Performance Information** variables are evenly split into two groups. One group defines how the project is performing against the project baselines (schedule, cost, scope) and the other group forecasts future performance:

Variances and Performance Indexes

- 5. Schedule Variance (SV)**
 - Is the project ahead or behind the schedule baseline?
- 6. Schedule Performance Index (SPI)**
 - How efficiently is the team completing project work?
- 7. Cost Variance (CV)**
 - Is there a budget deficit or surplus currently?
- 8. Cost Performance Index (CPI)**
 - How efficiently is the budget being spent?

Future Performance Forecasts

- 9. Estimate at Completion (EAC)**
 - What do we now think the total cost to complete all the project work will be?
- 10. Estimate to Complete (ETC)**
 - Given the EAC, how much more must be spent to complete all the remaining project work?
- 11. Variance at Completion (VAC)**
 - How much more/less do we now expect to spend than the original budget?
- 12. To-Complete Performance Index (TCPI)**
 - What CPI must the team operate at to finish the project at the defined budget goal?

Quick Knowledge Check #2

Bring Mr. PV and Ms. EV alive in your mind:

Draw Mr. PV

What do each care about?

The value of work that _____ be done.

Draw Ms. EV

The value of work that _____ done.

Understanding the EVM Variables

Place each variable into the correct category.

- BAC
- SV
- TCPI
- EV
- ETC
- PV
- SPI
- CPI
- AC
- VAC
- EAC
- CV

Work Performance Data (Data / Facts)

Variance and Performance Indexes

Future Performance Forecasts

How to Calculate and Interpret the 12 EVM Variables

Now that you can recognize the twelve EVM variables, the *next step* is to understand how to **calculate and interpret** the value of each. Remember the value interpretation questions, one of the three types of EVM questions included on the exam? This section teaches you how you answer those questions.

Learning by doing:

I am going to use one simple project scenario to show you how each variable provides unique insight into a project's health.

With each variable I am going to explain:

- **What it means**
- **How it is calculated**
- **How it is interpreted**

I want you to focus on how each new equation utilizes the variables we previously calculated and how to interpret the values.

After we go through all twelve variables, you are going to try your hand at solving a real EVM question. The only way you are going to learn is by working to answer real questions.

Please note that the table used to display the EVM values below is NOT the EVM problem-solving template you will learn to use in later chapters.

Project Scenario:

I recently hired a contractor to paint four walls in my kid's playroom. The work was scheduled to be completed in four days with one wall to be completed each day. The planned cost of completing each wall was \$100. After three days, 2.5 walls have been completed. The actual cost to-date is \$325 dollars and the total budget is \$400. **Using all twelve EVM variables, determine the current and projected performance.**

Work Performance Data

**Just the
Facts.**

BAC

AC

PV

EC

Work Performance Data:

What it Means:

When you start to read and solve for any question, you should always determine the Work Performance Data. ***When I say data, the word "FACTS" should jump into your mind.*** These facts are what will be used later to calculate the Work Performance Information.

Remember, the specific facts that we are looking for here are:

- ***Budget at Completion (BAC) = total amount allocated to spend on the project***
- ***Planned Value (PV) = value of the work that should be done***
- ***Earned Value (EV) = value of the work that is done***
- ***Actual Cost (AC) = total amount spent to complete the work to-date***

How to Find/Calculate Work Performance Data:

In most questions you will be provided the Budget at Completion (BAC) and the Actual Cost (AC). You will be required to infer and calculate the values for PV and EV using the context included in the question.

The definitions of each variable help to give you the perspective by which to infer each value (Don't forget Mr. PV and Ms. EV). In both cases, the budget at completion is critical to your calculation.

To calculate PV determine the amount of the schedule that has elapsed or the total amount of work that should be completed. Multiplying these proportions by the total budget at completion will calculate the PV.

The EV can often be calculated by determining the total percentage of the work that has been completed and multiplying it by the budget at completion. Remember EV equals the value of the work that has been completed.

How to Interpret Work Performance Data:

The **Work Performance Data** variables define the current and planned performance at the current time. Remember, these variables support no interpretation of whether or not the values are good or bad. *They are just impartial facts:*

There is no interpretation of work performance data. These facts are the raw materials used in all later equations to gain a perspective on the project's progress. The important thing with work performance data is being able to accurately derive it from the question.

Project Scenario Example: BAC, PV, EV, AC

Ok, let’s start figuring out how this painting project is progressing. Painting four walls doesn’t seem too hard, how bad could the contractor really be doing?

First step is to establish the facts. We need to know what the total budget is (BAC), what is the value of the work that should be done (PV), how much work is actually done (EV), and how much have we spent to get it done (AC).

I going to restate the scenario to help jog our memories.

Project Scenario:

I recently hired a contractor to paint four walls in my kid’s playroom. The work was scheduled to be completed in four days with one wall to be completed each day. The planned cost of completing each wall was \$100. After three days, 2.5 walls have been completed. The actual cost to-date is \$325 dollars and the total budget is \$400.

Using all twelve EVM variables, determine the current and projected performance.

	Definition	Calculation	Analysis
BAC	Total budget	BAC = \$400	The total planned budget for the project is \$400 . <i>(Drawn directly from the question)</i>
PV	Value of the work that <u>should</u> be done	PV = \$300	After 3 days, 3 of the 4 walls were to be completed. That’s equal to 75% of the total value (3 / 4 walls). Total value of the project is \$400. Therefore PV = (3/4 walls) * \$400 total value = \$300 <i>(This value is calculated by multiplying the percentage of the schedule that has elapsed by the total budget)</i>
EV	Value of the work that <u>is</u> done	EV = \$250	2.5 walls are completed; each wall is worth \$100. EV = 2.5 walls * \$100 value per wall = \$250 <i>(This value is calculated by multiplying the value of each finished wall by the number of walls actually painted)</i>
AC	<u>Actual</u> spend to complete the work	AC = \$325	The actual cost to-date is \$325 . <i>(Drawn directly from the question)</i>

Starting at the top we were able to pull out the BAC and AC easily. Budget is \$400 and the amount of cash that has left my pocket is \$325.

The PV and EV proved to take a little thinking. To get PV I focused on how much work “should” be done. I knew that the total project is scheduled to take four days with one wall to be completed each day. Knowing that it is the end of the third day I determined that three of four walls should be completed. However, I can’t just write “3 Walls” for PV! I needed to determine the value of the three walls. To find that I multiplied the percentage of walls completed (3 of 4) by the total budget. I could have also multiplied the number of walls that should be completed by the value received for each wall (PV = 3 walls * \$100 per wall = \$300). You get the same answer!

EV uses a similar logic on the value of each wall. The only difference is that I calculated the value of the 2.5 walls that were painted. Remember Ms. EV is always focused on what IS complete!

Work Performance Info

**Are we
ahead or
behind
right now?**

**CV CPI
SV SPI**

Variance and Performance Indexes:

After determining the Work Performance Data you are now able to calculate the overall health of the project. The following eight variables will provide the insights into the project health that you as a project manager need.

Schedule Variance (SV) and Schedule Performance Index (SPI)

Schedule analysis determines if the project is ahead or behind the approved schedule baseline and how efficiently work is being completed. The two major schedule-related metrics are Schedule Variance and Schedule Performance Index.

Schedule Variance (SV) measures if the project is ahead or behind the schedule baseline.

- **SV = EV – PV**
 - Positive SV value = Ahead of schedule
 - Negative SV value = Behind schedule

The SV will be zero at project completion. A project is not ahead or behind schedule when the schedule is complete!

Schedule Performance Index (SPI) measures how efficient the team is in completing project work.

- **SPI = EV / PV**
 - SPI value greater than 1 = Project is more efficient in completing work than originally planned
 - SPI value less than 1 = Less work has been completed than planned (project is less efficient)

The EV and PV values determined earlier are used to calculate both SV and SPI. The only difference between the SV and SPI equations is the mathematical operator between EV and PV. The SV equation uses a minus sign between the EV and PV, and the SPI equation uses a division sign.

Project Scenario Example:

This isn't rocket science. The entire project was scheduled to take four days with one wall being completed each day. That's the baseline schedule. We know that it is now the end of the third day and only 2.5 walls have been completed. It's obvious that the project is behind schedule. Let's prove it with math!

	Definition	Calculation	Analysis
SV	Amount that the project is ahead/behind schedule	$SV = EV - PV$ $SV = \$250 - \300 $SV = -\$50$	Negative SV indicates that the project is behind schedule.
SPI	How efficient the team is in completing the work	$SPI = EV / PV$ $SPI = \$250 / \350 $SPI = 0.83$	SPI less than 1 indicates that the team is less efficient in completing the work than projected.

The work performance data (EV and PV) that were calculated previously are used to determine the SV and SPI.

The SPI value below 1 shows that the painters have been less efficient in completing the schedule than originally planned (SPI) and therefore is behind the schedule baseline (negative SV). These equations supported what we logically determined.

Cost Variance (CV) and Cost Performance Index (CPI)

Cost Variance analysis determines if the project is ahead or behind the budget (approved cost baseline) and how efficiently resources have been spent. The two major cost-related metrics are cost variance and cost performance index.

Cost Variance (CV) measures the amount of budget deficit or surplus currently:

- **CV = EV - AC**
 - Positive CV value = Under budget
 - Negative CV value = Over budget

As the values in the equation highlight, CV determines if the value of the work that is done (EV) is more or less than what was spent to complete the work (AC).

CV only considers the work that IS **ACTUALLY** completed AND the resources spent to complete it, **NOT** the projected cost of the work that was PLANNED to be completed.

Cost Performance Index (CPI) measures the cost efficiency of the work completed.

- **CPI = EV / AC**
 - CPI value greater than 1 = Cost underrun (every dollar spent produced more than one dollar in value)
 - CPI value less than 1 = Cost overrun (every dollar spent produced less than one dollar in value)

The EV and AC values determined earlier are used to calculate both CV and CPI, the only difference between the CV and CPI equations is the mathematic operator used in between the EV and AC values.

Project Scenario Example:

Let's logic this out first. We know that the plan is for a wall to be painted each day. The total value of each completed wall is \$100. However, after three days only 2.5 walls have been completed, but a total of \$325 has been spent. Oh no, that isn't good. It seems like we are spending way too much and not getting enough done! Let's check with math.

	Definition	Calculation	Analysis
CV	Amount of budget deficit or surplus currently	$CV = EV - AC$ $CV = \$250 - \325 $CV = -\$75$	Negative CV indicates that the project is over budget.
CPI	Cost efficiency of the work completed	$CPI = EV / AC$ $CPI = \$250 / \325 $CPI = 0.77$	CPI less than 1 indicates a cost overrun.

The CV and CPI results clearly indicate that the project is in poor cost position as it is over budget. The negative CV indicates that the amount spent (AC) exceed the value of the work actually delivered (EV). This confirms that we are over budget. Who ever is managing this project needs to figure out what the problem is PRONTO! Additionally, the CPI indicates that every dollar spent is not delivering an equivalent dollar in value. I'm worried if we don't find a way to be more efficient I will end up paying a ton more than I planned to get these four walls painted. Before I do anything else, let's project the total cost.

Work Performance Info

**What does
the future
look like?**

EAC

ETC

VAC

TCPI

Future Performance Forecasts:

There are four future cost related metrics (EAC, ETC, VAC, TCPI).

Each of these takes the existing project performance and baseline and extrapolates a different perspective on the future of the project. To say it simply, given what we've done up to this point, these metrics tell us what the end of the project will look like.

I am going explain the four metrics in two groupings. Each grouping is related in the questions they answer and the corresponding questions/actions that they potentially initiate:

Group 1:

- **Estimate at Completion (EAC) = total projected cost at project completion (given past performance)**
- **Estimate to Complete (ETC) = total additional amount that will need to be spent to complete the project**

Group 2:

- **Variance at Completion (VAC) = total amount more/less that is projected to be spent to complete the project than was was planned**
- **Actual Cost (AC) = the CPI that must be maintained for the remainder of the project to finish on the baseline (or goal)**

Lets start with group 1.

Estimate at Completion (EAC) and Estimate to Complete (ETC)

What a difference one word can make, **At vs To**. These two variables, EAC and ETC, are used to project two entirely different things. The difference is clear when you consider the words "at" and "to."

The **Estimate at Completion (EAC)** projects what the total cost of the project will be when it is complete. This considers how the project has performed to date and the projected performance going forward given different scenarios.

In comparison, **Estimate to Complete (ETC)** calculates the total additional amount of funding that will have to be spent from the current day on to complete the project.

How to Calculate EAC and ETC:

Both EAC or ETC coldly predict future results based on the team's performance to date and the future risks defined.

Estimate at Completion (EAC) determines the expected total cost of all project work. There are three methods used to calculate EAC, each with different assumptions. Evaluate each question on the exam to determine the appropriate equation to use. The assumption most commonly used on the PMP® exam is that the work will continue to be performed at the current CPI (first assumption listed below). This is the equation I include in the template.

EAC equations (based on assumptions):

- Work will continue to be performed at the current CPI:
 - $EAC = BAC / CPI$ **(MOST COMMON EQUATION – Learn this one!)**
- Work will be performed at the original budgeted rate:
 - $EAC = AC + (BAC - EV)$ *(For instance, we had issues in the project, but fixed them and now we will perform as originally expected)*
- Work will continue to be performed at both the current CPI and SPI:
 - $EAC = AC + [(BAC - EV) / (CPI \times SPI)]$

Estimate to Complete (ETC) calculates the expected cost to finish all remaining project work. Notice the EAC value calculated above and the actual cost of the project to date are used in the equation:

- $ETC = EAC - AC$

Project Scenario Example:

We know that the project is behind schedule and budget. Not good! I'm almost scared to calculate what the total cost is projected to be when the project finishes (EAC) if nothing changes and how much MORE money I need to spend to get the job finished (VAC). No need to be scared. Let's do it!

	Definition	Calculation	Analysis
EAC	Expect total cost at the completion of all project work	$EAC = BAC / CPI$ $EAC = \$400 / 0.77$ $EAC = \$520$	If the current cost efficiency rate is maintained, the total spend will be \$520, exceeding the BAC.
ETC	Expected cost to complete all remaining project work	$ETC = EAC - AC$ $ETC = \$520 - \325 $ETC = \$195$	\$195 will have to be spent to complete the remaining work.

I used the most common equation to determine the Estimate at Completion ($EAC = BAC / CPI$) because it is my assumption that the current performance levels will be maintained. When I ran the numbers I determined that the $EAC = \$520$.

What does that mean to you?

To me it means that I will end up having to shell out a total of \$520 to pay for these four walls when I originally thought it would cost \$400.

When I calculate the Estimate to Complete the impact of this really hits home.

I've already spent \$325. The ETC of \$195 means I will have to pay the painters another \$195 to finish the job. I am not loving this. Maybe I picked the wrong contractor. Maybe I should have been involved earlier. Before I take any action let's calculate the last two metrics.

Variance at Completion (VAC) and To-Complete Performance Index (TCPI)

Variance at Completion (VAC) defines the difference between what the project was originally expected to cost (BAC) and what it is now predicted to cost (EAC). **Be careful** when interpreting VAC. A positive VAC means we are currently projected that at the end of the project we will not fully spend our budget. A negative VAC value equates to additional money that will need to be spent.

- $VAC = BAC - EAC$
 - Positive VAC value = Under budget
 - Negative VAC value = Over budget

To-Complete Performance Index (TCPI) defines the CPI that must be achieved with the remaining resources to meet a specific management goal. The BAC or EAC could be the management goal. The TCPI results define the “level of difficulty” in achieving the desired business goal. TCPI values greater than 1 are harder to complete; those less than 1 are easier to complete. The specific management goal will dictate which equation is used:

- BAC: The efficiency that must be maintained to complete on plan (BAC)
 - $TCPI = (BAC - EV) / (BAC - AC)$
- Current EAC: The efficiency that must be maintained to complete the project at the current EAC
 - $TCPI = (BAC - EV) / (EAC - AC)$

Project Scenario Example:

	Definition	Calculation	Analysis
VAC	VAC defines the difference between the original budget and what is projected for the actual budget	$VAC = BAC - EAC$ $VAC = \$400 - \520 $VAC = -\$120$	VAC of -\$120 indicates that the project will end over budget, requiring an additional \$120 than the original BAC value.
TCPI	CPI that must be maintained to complete on plan (BAC)	$TCPI = (BAC - EV) / (BAC - AC)$ $TCPI = (400 - 250) / (400 - 325)$ $TCPI = 2.0$	TCPI of 2.0 indicates that the team’s cost efficiency must improve from 0.77 to 2.0 to complete on plan. This is a significant increase in performance.

Calculating the EAC told us that if the painters don’t improve how they are completing their work the total spend to complete the project will be \$520. As a PMP author I really want my project’s to finish on budget! Let’s do some quick math to see how much we are currently projected to miss our budget by. The value that tells us this is the Variance at Completion (VAC).

The VAC tells us that we will over spend our budget by -\$120.

This is not good. We are 2.5 days into a 4 day project. What can we do? No, the better question is, how much better does the team have to be over the remainder of the project to hit our original BAC goal?

My stress shoots to the roof as I look at the TCPI value of 2.0. Do you understand what this means?

A TCPI of 2.0 means that to hit our original budget the team must be 2x as efficient as we originally projected (baseline CPI values are 1.0). You might say, that doesn’t seem bad, but consider that up to this point the painters have worked at a CPI of 0.77. That means they have to improve from 0.77 to 2.0 overnight! Not likely!!

Oh no, I better get involved and see if there are process improvements we can do quickly! Next time I promise to manage this project more proactively from the beginning...

Match the EVM variable with the question it answers.

BAC	What's the total budget allocated for the project?
SV	Value of the work that should be done?
TCPI	Value of the work that is be done?
EV	Actual amount spent on the project?
ETC	Is the project ahead or behind schedule?
PV	How efficiently is the team completing project work?
SPI	Is there a budget deficit or surplus currently?
CPI	How efficiently is the budget being spent?
AC	What do we now think the total cost to complete all the project work will be?
VAC	Given the EAC, how much more must be spent to complete the remaining project work?
EAC	How much more/less do we now expect to spend than the original budget?
CV	What CPI must the team operate at to finish the project at the defined budget goal?

Quick Knowledge Check #3

Draw Smiling or Frowning Faces















to define what each metric tells about project performance.

Smiling = project results are positive

Frowning = project results not positive

If you think this is childish, relax!

The variable results need to invoke emotions instantly with you. This will help you do that

Schedule Variance (SV)		Schedule Performance Index (SPI)	
Negative Value	Positive Value	Less than 1	More than 1
			
Cost Variance (CV)		Cost Performance Index (CPI)	
Negative Value	Positive Value	Less than 1	More than 1
			
Estimate at Completion (EAC)		Estimate to Complete (ETC)*	
Lower than BAC	Higher than BAC	What question does this variable answer?	
		<input data-bbox="880 1304 1455 1434" type="text"/>	
Variance at Completion (VAC)		To-Complete Performance Index (TCPI)	
Negative Value	Positive Value	Less than 1	More than 1
			

* I did not ask you to put a smiley / frowning face on ETC because it coldly calculates the amount that needs to be spent to complete the project. This value absolutely can invoke positive/negative emotions when evaluating project status. However, get obtain that realization one must evaluated against the originally planned BAC.

EVM Free Coffee Challenge

**Can you solve a
real EVM
question in under
5 minutes?**



Get it right... I buy you coffee.

CLAIM YOUR FREE CUP OF JOE.

POST A SELFIE WITH THE QUESTION SOLVED TO
LINKEDIN AND FACEBOOK.

MAKE SURE YOU USE THE TAGS

#PMP, #PMMASMASTERPREP, #EVMMADEEASY

FEELING THE PAIN OF EVM WITHOUT A TEMPLATE: 5-MINUTE FREE COFFEE CHALLENGE #1

Feel ready to start solving EVM questions?

Let's think about how much you have learned. You now know the type of questions to expect, the difference between data and information, you've met Mr. PV and Ms. EV, you know all of the twelve variables, and how to interpret their results. We even walked through the painting example where you saw all the metrics come alive.

Take a second and congratulate yourself. You've come along way. You are only a few more pages from becoming an EVM master.

BUT, there is one last thing I need you do for me before I teach you my template and process.

I need you to use your new knowledge to solve a PMP question... **In under 5 minutes.**

Some of you might feel confident, others worried. Regardless, everyone of you must take on the 5 minute challenge.

Here are the rules.

No looking ahead and using my template. I am going to give you the equations in standard data dump fashion.

Set a timer for five minutes and do your best. Five minutes should be plenty of time. On the real exam you have approximately 1.2 minutes per question.

This is NOT ONLY about getting the right answer.

Of course I want you to do your best to get the right answer, but even more importantly I want you to remember the "experience" of solving this EVM question. Do your **best to objectively observe the steps you are following** to solve the question and **how you are feeling** (confused, lost, excited, whatever) when you are working through the problem.

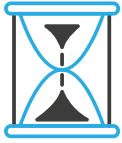
This realization is the REAL gift you are going to get from solving this first question without the template. It will help you appreciate the difficulty of EVM question solving and the impact it can have on your overall exam experience.

Before you start, let's raise the stakes!

In my normal classes, I will buy a cup of coffee for anyone who solves the question in under 5 minutes. Same rules go for you. If you solve the problem in under 5 minutes, take a selfie of you holding up the completed question and shoot me the picture and a message (scott@pmmasterprep.com). Ill get you your free cup of coffee!

Ok, set your timer to five minutes, flip the page, and get started!

Feel the Pain of EVM WITHOUT a template



Can you solve this question in 5 min?

Rules: No template... just the equations I data dumped below & your brain

You are the project manager of a project to widen a 10-mile section of freeway. The approved budget is \$50 million and the approved schedule is 40 weeks. After 22 weeks, your team has completed 6 miles of the freeway and \$32 million has been spent. What is the estimate to complete?

- a.) \$20.25 million
- b.) \$21.33 million
- c.) \$23.33 million
- d.) \$53.33 million

Traditional EVM Data Dump:

$$EAC = BAC / CPI$$

$$EAC = AC + (BAC - EV)$$

$$TCPI = (BAC - EV) / (BAC - AC)$$

$$TCPI = (BAC - EV) / (EAC - AC)$$

$$SV = EV - PV$$

$$CV = EV - AC$$

$$VAC = BAC - EAC$$

$$CPI = EV / AC$$

$$SPI = EV / PV$$

$$ETC = EAC - AC$$

Use the space below to solve the EVM Question

After 5 minutes, how did you feel?

EVM problems are hard.
I need help!!!

I feel ok, but
I need practice

I am prepared for
any EVM question,
Bring them ON!!!

Reflections on Solving a Real PMP Question:

Did you solve the question in under 5 minutes?

The correct answer is \$21.33.

Did you get the correct answer in under 5 minutes?

If you did, great. (Claim your free cup of coffee by sending a picture and message to scott@pmmasterprep.com)

If you struggled, don't worry. You will be able ace questions like this in way less than 5 minutes very shortly. (plus I will answer this question later in the book!)

Before we move forward, I want you to reflect on how you felt while solving the question:

- **Was it stressful OR relaxing?**
- **Did you feel more organized and aligned OR disorganized and confused?**
- **Was the process you used repeatable?**
- **Was solving the question FUN?**

If you are anything like the legions of students we teach weekly, the experience of solving the EVM question was PAINFUL and STRESSFUL. Don't fret, you are not alone. Now that you felt the pain of solving an EVM question without my template, let me ask you one more question:

***If I could eliminate all the pain
you experienced in solving the question...
would you commit yourself to mastering my process?***

**If so, read on.
I am going to make you an EVM Master.**

"I realized I didn't need to memorize the formulas. I just needed to know the template.

I tell you, that was a LIFESAVER.

Every question was easy!"

**NATISHA G.
(DOMINATED THE PMP)**

UNDERSTANDING MY EVM TEMPLATE

My EVM template is comprised of three sections, each designed to organize the data and equations that you need to solve any EVM question:

1. Work Performance Data
2. Variance and Performance Indexes
3. Future Projections

The template is super-simple to use and very effective in solving the EVM questions you'll encounter on the exam. In addition to teaching you how to use the template, I am going to teach you *funky memory tricks* to help you easily recreate the entire template for yourself during the exam. But first, let's go deeper into each of the three sections.

PM Master Prep Earned Value Management Template		
Work Performance Data	BAC	Total budget
	PV	Work that <u>should</u> be done
	EV	What <u>is</u> done
	AC	Actual spend
Variance and Performance Index	$SV = EV - PV$	
	$CV = EV - AC$	
	$SPI = EV / PV$	
	$CPI = EV / AC$	
Future Projections	$EAC = BAC / CPI$	
	$ETC = EAC - AC$	
	$VAC = BAC - EAC$	
	$TCPI = (BAC - EV) / (BAC - AC)$	

Quick reminder: When I say that you will use this template to solve any EVM question, I mean that includes any EVM calculation question, EVM value interpretation question, **and** EVM graph question—all three types!

Components of the EVM Template

1. Work Performance Data contains the raw materials for your success.

EVM questions ask you to assess a project’s current or projected progress in terms of one of the following: scope, schedule, or cost. Regardless of what the question asks you to solve for, you will always need to first determine the Work Performance Data. The Work Performance Data values are the raw materials that you will use in all other equations. It is critical that you **ALWAYS define these values** when you solve any EVM question.

Four Work Performance Data values are included in the top portion of the template. These four variables are the facts that describe the condition of the project at a specific time:

- **Budget at Completion (BAC)** = Total project **budget**
- **Planned Value (PV)** = What work **should** be done
- **Earned Value (EV)** = What work **is** done
- **Actual Cost (AC)** = How much has been **spent**

Remember: When approaching **any** EVM question, **start** by first documenting this project status data. The values will either be directly stated within the question or easily deduced from the given information.

EPM Master Prep		Earned Value Management Template
BAC		Total budget
PV		Work that <u>should</u> be done
EV		What <u>is</u> done
AC		Actual spend

2. Variance and Performance Indexes define the project’s current performance

This section organizes the variance and performance index equations for both Schedule (SV and SPI) and Cost (CV and CPI). Notice that the template separates the schedule and cost equations into two identical sections with schedule on the left and cost on the right. Within each side, the variance equation is recorded above the performance index equation.

$SV = EV - PV$	$CV = EV - AC$
$SPI = EV / PV$	$CPI = EV / AC$

3. Projections define the potential final result and uncover the need to improve

The Estimate at Completion (EAC), Estimate to Complete (ETC), Variance at Completion (VAC), and To-Complete Performance Index (TCPI) equations project the results at the completion of the project. Calculating these values often uncovers the need to improve project performance.

$EAC = BAC / CPI$
$ETC = EAC - AC$
$VAC = BAC - EAC$
$TCPI = (BAC - EV) / (BAC - AC)$

LETTING THE TEMPLATE GUIDE THE WAY

I specifically designed my template to **align every EVM equation** in a way that **simplifies the EVM question-solving process**.

No longer will you waste time randomly searching for all of the equations you need and deciding in what order to use them. Instead, the path to the answer is clean and simple from top to bottom and much much faster.

Follow the smooth and logical top to bottom flow to the answer.

You will never be forced to jump back up against the flow. Instead, as you move down the template, it will provide exactly what is needed for the next step of the process until you arrive at the correct final answer.

The 3 Step Process to Solve EVERY EVM Question

Understanding the structure, components, and flow of the EVM template is not enough. The exam brings added stress. To ensure you succeed, you **MUST master a process** for using the template that is ***simple, repeatable, and effective***.

As I said at the beginning of this book, this method is not just about the template. It is about a question-solving process. The three-step process outlined below will help you decode every EVM question and pave a clear path for you to calculate the correct answer.

- 1) Identify what is asked for**
- 2) Define what is given**
- 3) Follow the path to solve the question**

1. Identify what is asked for:

Read the question the first time with one single focus: to determine "What value am I being asked to solve for?" (you are never going to be asked to solve for more than one value). After you identify that value, **draw a star next to that equation** on the template. That is your target.

2. Define what is given:

Next, focus on defining the values for the four Work Performance Data variables (BAC, PV, EV, AC) in the top section of the template. Many of these values will be explicitly stated in the wording of the actual question, but some will have to be inferred.

These values are the raw materials you use to solve the question. Multiple equations are going to need these values. You must have them ready to use.

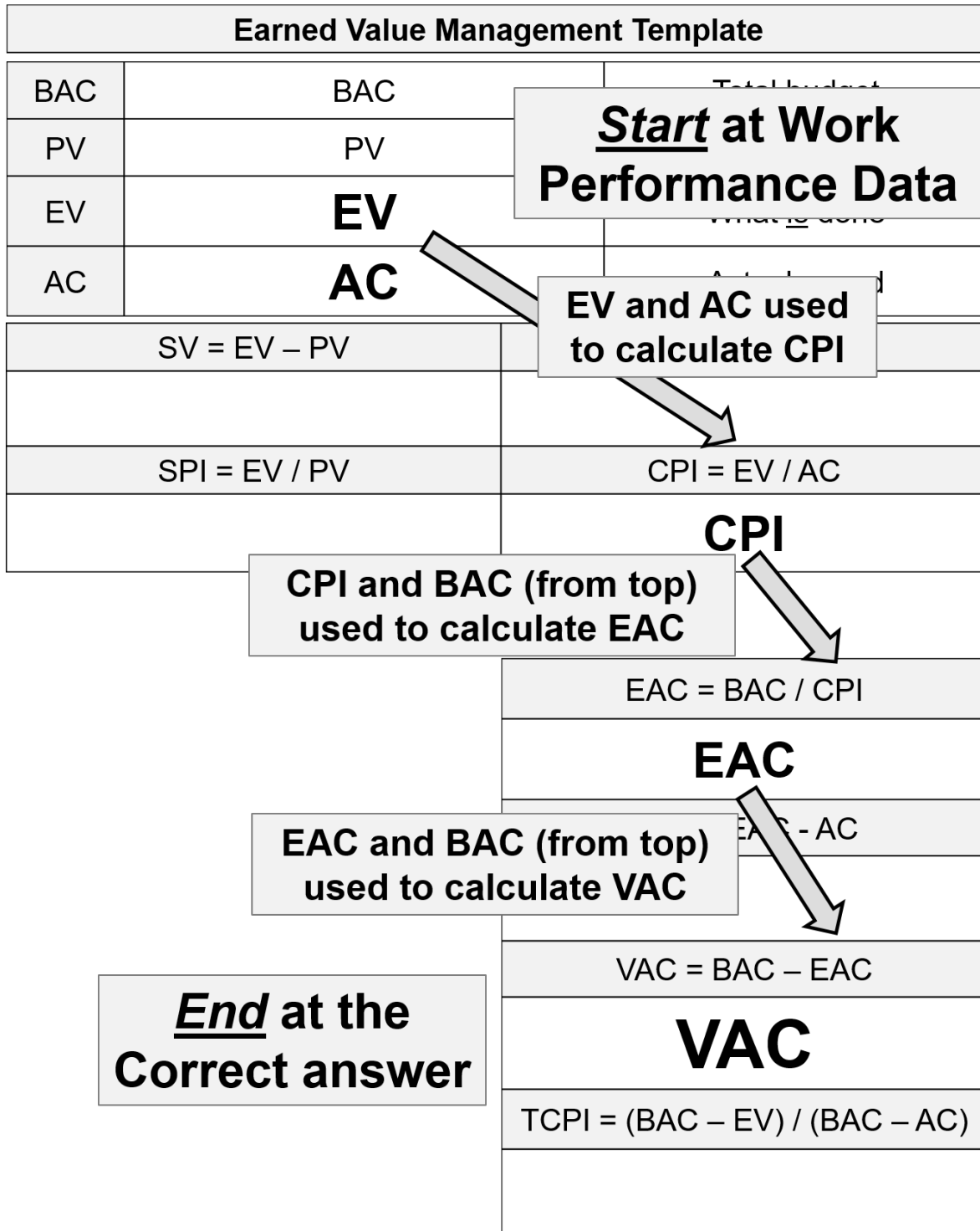
PLEASE NOTE: *You will often have to use logic and clues to infer/calculate these values from the project description in the question. NOT every value will be explicitly stated.*

3. Follow the path to solve the question:

Draw a dot next to every equation that must be used to arrive at the answer. In doing this, you will create a clear path for solving the question. Follow the path from top to bottom until you get the correct answer.

The Power of Flow

The picture below depicts the **top to bottom question-solving flow** for an EVM question asking you to calculate the Variance at Completion (VAC). Notice how the Work Performance Data values at the top are used within the lower equations and how each equation leverages the values produced by the previous equations.



The flow of equations on the template has **ELIMINATED** the random searching for equations and multiple rereadings of the question.

THREE-STEPS TO SOLVE EVERY EVM QUESTION

1

**IDENTIFY WHAT IS
ASKED FOR**

2

DEFINE WHAT IS GIVEN

3

FOLLOW THE PATH

The 3 Step Process in ACTION

Remember the pain you experienced when taking the five-minute question challenge?

I am going to solve that SAME question using my EVM template and process. This will prove to you how my EVM template simplifies the question-solving process and takes away your stress and pain. Follow along as I walk through each of the three question-solving steps. In your mind, compare this process with what you experienced solving the five-minute question challenge example. **Which experience would be better for you?**

Question:

You are the project manager of a project to widen a 10-mile section of freeway. The approved budget is \$50 million and the approved schedule is 40 weeks. After 22 weeks, your team has completed 6 miles of the freeway and \$32 million has been spent. What is the estimate to complete?

- a. \$20.25 million
- b. \$21.33 million
- c. \$23.33 million
- d. \$53.33 million

Step 1: Identify what is asked for

You are the project manager of a project to widen a 10-mile section of freeway. The approved budget is \$50 million and the approved schedule is 40 weeks. After 22 weeks, your team has completed 6 miles of the freeway and \$32 million have been spent. **What is the estimate to complete?**

The question is asking us to calculate the “Estimate to Complete,” so I draw a star on the template at the ETC section.

Earned Value Management Template	
BAC	Total budget
PV	Work that <u>should</u> be done
EV	What <u>is</u> done
AC	Actual spend
$SV = EV - PV$	$CV = EV - AC$
$SPI = EV / PV$	$CPI = EV / AC$
	$EAC = BAC / CPI$
	★ $ETC = EAC - AC$
	$VAC = BAC - EAC$
	$TCPI = (BAC - EV) / (BAC - AC)$

What is asked for →

Step 2: Define what is given

In this step, you must first decode the question to identify the Work Performance Data that you will use in later equations to solve the question. Some data will be directly stated and other values will need to be calculated using the facts described in the question.

To identify these key Work Performance Data values (BAC, PV, EV, AC), evaluate the question carefully. While rereading slowly, focus your attention on finding key numerical and descriptive values that define details of the project plan and the current progress. Underline these values.

Highlight key numerical and descriptive values

You are the project manager of a project to widen a 10-mile section of freeway. The approved budget is \$50 million and the approved schedule is 40 weeks. After 22 weeks, your team has completed 6 miles of the freeway and \$32 million have been spent. What is the estimate to complete?

Define BAC, PV, EV, and AC using the highlighted values

In evaluating the highlighted values, I first look for any values that are clearly stated and determine that two of the key Work Performance Data values (the Budget and the Actual Cost) are provided.

The total budget for the project is \$50 million. (That is the BAC)

The total spend to date is \$32 million. (That is the AC)

In this example, the values of PV and EV are not directly stated and instead require me to infer them using the given information regarding the length of the highway, the total amount of work completed, and the schedule.

I can calculate PV using the information on how long the project has been underway vs the project's total schedule. I can calculate that 55% of the total schedule has passed (22 of the 40 scheduled weeks). To convert the schedule progress to a monetary value, I can multiply the 55% schedule complete against the total budget.

Planned Value is \$27.5 million (value of the work that SHOULD be done)

The EV is calculated based on the number of miles already completed out of the entire 10 miles. Again, I am required to calculate the total value of the 6 miles using the total budget. I know that the total value of all 10 miles is \$50 million. The 6 miles completed is equivalent to 60% of the project's total value.

Earned Value is \$30 million (value of the work that IS done)

This example emphasizes the importance of understanding the foundational meanings of the key EVM terms so that you can infer data values.

PM Master Prep		Earned Value Management Template	
BAC	\$50M	Total budget	
PV	(22 / 40 weeks) (BAC) = \$27.5M	Work that <u>should</u> be done	
EV	(6 / 10 miles) (BAC) = \$30M	What <u>is</u> done	
AC	\$32M	Actual spend	

Step 3: Follow the path to solve the question

Now that “What is asked for” and “What is given” are defined, all that is left to do is to define the path that leads to the answer. I add dots on the template to mark the equations required to solve the question. I then methodically work my way down the template, solving for each marked equation until I arrive at the Estimate to Complete value. To follow this logical flow start at the Work Performance Data and methodically move downwards. You will see that I need to:

- Calculate CPI, then
- Calculate EAC, then
- Calculate ETC—my final answer!

PM Master Prep Earned Value Management Template		
BAC	\$50M	Total budget
PV	(22 / 44 weeks) (BAC) = \$27.5M	Work that <u>should</u> be done
EV	(6 / 10) (BAC) = \$30M	What <u>is</u> done
AC	\$32M	Actual spend
SV = EV – PV		CV = EV – AC
SPI = EV / PV		● CPI = EV / AC
		CPI = \$30M / \$32M CPI = 0.9375
		● EAC = BAC / CPI
		EAC = \$50M / 0.9375 EAC = \$53.33M
		★ ETC = EAC - AC
		ETC = \$53.33M - \$32M ETC = \$21.33M
		VAC = BAC – EAC
		TCPI = (BAC – EV) / (BAC – AC)

End at the correct answer

➔

It’s now time to find my calculated ETC value among the answer choices and record my final answer.

Question:

You are the project manager of a project to widen a 10-mile section of freeway. The approved budget is \$50 million and the approved schedule is 40 weeks. After 22 weeks, your team has completed 6 miles of the freeway and \$32 million has been spent. What is the estimate to complete?

- a. \$20.25 million
- b. \$21.33 million**
- c. \$23.33 million
- d. \$53.33 million

Ask yourself, is using the template or randomly searching for equations easier?



2nd Chance!



EVM Free Coffee Challenge

**Can you solve a real
EVM question in
under 5 minutes?**



This time... You Got THIS!

CLAIM YOUR FREE CUP OF JOE.

POST A SELFIE WITH THE QUESTION SOLVED TO
LINKEDIN AND FACEBOOK.

MAKE SURE YOU USE THE TAGS

#PMP, #PMMASTERPREP, #EVMMADEEASY

PROVING THE POWER OF MY EVM TEMPLATE: 5-MINUTE FREE COFFEE CHALLENGE #2

You are now ready to take a giant step into your evolution as an EVM master.

We are going to go through another 5-minute free coffee challenge! Don't be scared, you have the knowledge, the template, and the process.

Same rules, BUT now the deck is stacked in your favor!

Just like last time set a timer for five minutes and do your best.

I have provided my template and the problem solving process steps to help guide you. You can do this.

PLUS You Can Still Win a Cup of Coffee!

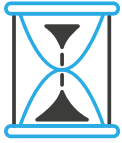
I want to reward you for building your skills. Therefore.... ***the 5-minute free coffee reward is still in play!***

When you solve the question in less than 5-minutes take a selfie of you holding up the completed question and shoot the picture and a message (scott@pmmasterprep.com). Ill get you your free cup of coffee!

Here's an example of another student holding up the template for inspiration!

Ok, set your timer to five minutes, flip the page, and get started!

EVM Free Coffee Challenge #2



Can you solve this question in 5 min?

Rules: Use my EVM template and the three step problem solving process!

You are the project manager responsible for the overhaul of six large industrial generators. The entire contract is expected to be completed in one hundred days at a total cost of \$1,000,000. Forty-five days have passed, \$500,000 has been spent, and 40% of the total work has been completed. What is the estimate at completion for this project?

- a.) \$750,000
- b.) \$833,333
- c.) \$1,250,000
- d.) \$1,500,000



Ok, this time it's serious.

You have the skills.

You can do it!

(I'm here to support you in template form)

Use the space below to solve the EVM Question



Earned Value Management Template

BAC		Total budget
PV		Work that <u>should</u> be done
EV		What <u>is</u> done
AC		Actual spend

$SV = EV - PV$	$CV = EV - AC$
$SPI = EV / PV$	$CPI = EV / AC$

$EAC = BAC / CPI$
$ETC = EAC - AC$
$VAC = BAC - EAC$
$TCPI = (BAC - EV) / (BAC - AC)$

EVM Free Coffee Challenge #2: Answer

PM Master Prep Earned Value Management Template		
● BAC	\$1,000,000	Total budget
PV	$(45 / 100 \text{ days}) * (\$1,000,000) = \$450,000$	Work that <u>should</u> be done
● EV	$(40\%) * (\$1,000,000) = \$400,000$	What <u>is</u> done
● AC	\$500,000	Actual spend
SV = EV – PV		CV = EV – AC
SPI = EV / PV		● CPI = EV / AC
		CPI = \$400,000 / \$500,000 CPI = 0.80
		★ EAC = BAC / CPI
		EAC = \$1,000,000 / 0.80 EAC = \$1,250,000
		ETC = EAC - AC
		VAC = BAC – EAC
		TCPI = (BAC – EV) / (BAC – AC)



I owe you a cup of coffee, if you got it correct.
Please post a selfie of your success. I'll send you a gift card!

EVM Free Coffee Challenge #2: Answer

You are the project manager responsible for the overhaul of six large industrial generators. The entire contract is expected to be completed in one hundred days at a total cost of \$1,000,000. Forty-five days have passed, \$500,000 has been spent, and 40% of the total work has been completed. What is the estimate at completion for this project?

- a.) \$750,000
- b.) \$833,333
- c.) \$1,250,000**
- d.) \$1,500,000



I owe you a cup of coffee, if you got it correct.

Please post a selfie of your success. I'll send you a gift card!



**Watch me solve this problem!
I explain exactly how to do it.**



Learn to Create the EVM Template

Practice Makes Perfect: Practice Creating the Template

LEARN TO CREATE THE EVM TEMPLATE

The EVM template provides an easy, structured method that anyone can follow to solve every EVM question on the PMP exam. Please remember that you will not be able to bring copies of this template into the exam. Instead, you will have to recreate the template from memory on the blank scratch paper the exam center provides.

Fear not, I will teach you a process to help you remember the template and easily recreate it. This is the exact method I created to teach myself. The method uses memory tricks to help the details stick in your brain. The tricks may seem funny when you start, but trust me, they work. This chapter details the process and memory tricks you will use to create the template.

Step 1: Draw the template structure

Step 2: Complete the “Work Performance Data” section

Step 3: Complete the “Variance and Performance Indexes” section

Step 4: Complete the “Projections” section

The following pages walk you step-by-step through the memory tricks that I use to create the EVM template.

** I want you to go through this process I have laid out to create the template. Work hard at

Please note that there are tons of different brains out there. If you can find a simpler way to remember the template and it works for you. That is great! My goal is that you find a way to create the template so that it can be a valuable tool to help you ace questions on the exam. If you create your own way to build the template that is great. Bottom line, learn to create the template and USE the template to get EVERY EVM question correct! **

If you need extra help and/or want to learn faster, I can personally walk you through how to create the template?

Check out the EVM Made Easy eCourse.

I have multiple videos where I explain the creation of the template with all the memory tricks and the logic behind it all. These videos will help the template creation come alive! After watching the videos you will be able to create the template on your own.

I literally walk you slowly through EVERY step. (Plus I explain everything else in this book!)

**Grab the EVM Made Easy video course, so that you can
learn to Create the EVM Template and ace every EVM question!**



Creating the EVM Template Step-by-Step:

Step 1: Draw the template structure

You will start your exam with a blank sheet of paper. The first thing you must do is draw the boxes that form the template. Note that each of the three sections are further divided:

- Top section is broken up into a 4 by 3 grid
- Middle section is broken up into four identical sections
 - Small portion at the top where you will write equations
 - Larger portion below where you will use the equation to calculate answers
- Bottom section is broken up into 4 identical sections

Each section of the template is designed to hold a specific piece of information. However, before you begin to memorize where those equations go, just practice drawing the empty template structure from memory. Once you can recreate the structure, move on to step 2.

This is what the basic structure looks like a clean computer template. Notice the three distinct sections and the lines.

PM Master Prep Earned Value Management Template		
Top		
Middle		
Bottom		

Here is what it looks like when I draw it on a blank sheet of paper. Notice that I spent the time to draw the sections and make it as neat as I can!

	BAC	Total Budget
S	PV	Should Be Done
●	EV	<u>IS</u> Done
C	AC	Actual Cost

$SU = EV - PV$	$CV = EV - AC$
$SPI = EV / PV$	$CPI = EV / AC$

$EAC = BAC / CPI$
$ETC = EAC - AC$
$VAC = BAC - EAC$
$TCPI = (BAC - EV) / (BAC - AC)$

Step 2: Complete the “Work Performance Data” section

Say “B Pea, SC”

After you draw the template, I want you to say the following two phrases to yourself:

- “B Pea, SC”
- “B like the letter, P like the vegetable. SC are the first two letters of the guy’s name who made me say this.”

I know it sounds funny, but go ahead and say these two statements again and again. Burn them into your brain. (And remember that my name is Scott.) These statements will help you remember what labels to put into the top section.

Write the letters of “B Pea, SC” into the top section of the template like I show in the example below. Please **NOTICE how the S and the C are written to the left of the template and that there are two arrows emanating from the E.** These arrows will help you easily create the SV, CV, SPI, and CPI equations later.

PM Master Prep Earned Value Management Template		
	B	
S	P	
	E	
C	A	

Fill in Variables, Fill in Definitions

The “B Pea, SC” phrase is a memory jogger. It helps you remember the specific EVM variable to write in each box. You learned the importance of the Work Performance Data. This is the section where we record that data!

The “B PEA” signify the 1st letters of the Work Performance Data variables. Write in the full names (i.e. B = BAC).

Also, now write simple definitions of the four “B Pea” variables in the farthest column to the right. The simple definitions provide you with a reminder of what each variable means. This will help you interpret the information provided in the EVM question to pull out the correct values for each variable.

The four key words in the definitions you need to remember are:

- Budget
- Should
- Is
- Actual

PM Master Prep Earned Value Management Template		
	BAC	Total budget
S	PV	Work that <u>should</u> be done
	EV	What <u>is</u> done
C	AC	Actual spend

Step 3: Complete the “Variance and Performance Indexes” section (SV, SPI, CV, CPI)

The middle section of the template contains the four equations that are used to calculate schedule and cost variance and performance index values. The left side of the middle section contains SV and SPI and the right side contains CV and CPI.

The arrows in the top section tell you exactly how to build all four equations. If you look at how these two arrows move out from the EV value, they look a little like butterfly wings (the butterfly is turned on its side! I know It’s weird, just image a sideways butterfly) Just picture it: EV is the butterfly body and the wings spread out to PV and AC. I know it’s a weird way to think about it, but I created the imagery **so that you would remember it**. See, now when you look at it, do you see butterfly wings? (take a look at the previous page)

One by one, you will follow the each wing from the body (EV) outwards to create the next four equations needed.

Follow the Butterfly Wing UP to Create the SV and SPI Equations



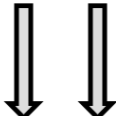
Please note that you wrote the S above the C in the top section. This helps to remind you that the Schedule variance and performance index equations will be built first, before the Cost variables.

To build the SV equation, start by writing “SV =” in the upper left hand box of the middle section of the template. Then refer to the top section and follow the butterfly wings up the “S” arrow from EV to PV. This path defines the order of the equation. Remember that there is a minus sign between the EV and PV values.

- **SV = EV – PV**

To build the SPI equation in the box directly below the SV equation, “pull down” the exact variables used in the SV equation and change the minus sign to a division sign. And with that, you have created both the SV and SPI equations. Wasn’t that easy?

- **SPI = EV / PV**

PM Master Prep Earned Value Management Template		
BAC		Total budget
 PV		Work that <u>should</u> be done
 EV		What <u>is</u> done
AC		Actual spend
SV = EV – PV		
		
SPI = EV / PV		

Follow the Butterfly Wing DOWN to Create the CV and CPI Equations

To create the CV and CPI equations, you will follow the same process used to create the SV and SPI equations. Only difference is that you **follow the butterfly wing from EV DOWN to AC**.


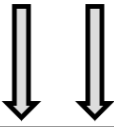
The “C” next to the downward butterfly wing helps you remember you will be creating the CV and CPI equations.

Start by writing “CV =” in the upper right hand box of the middle section of the template, then follow the butterfly wing down the “C” arrow to define the order of the variables in the CV equation.

- **CV = EV – AC**

As done in the schedule section, create the CPI equation in the box directly below the CV equation by “pulling down” the exact variables used in the CV equation and changing the minus sign to a division sign. Again, wasn’t that easy?

- **CPI = EV / AC**

 Earned Value Management Template		
BAC		Total budget
PV		Work that <u>should</u> be done
EV		What <u>is</u> done
AC		Actual spend
SV = EV – PV		CV = EV - AC
		
SPI = EV / PV		CPI = EV / AC

Step 4: Complete the “Projections” section (EAC, ETC, VAC, TCPI)

The bottom section of the EVM problem-solving template contains the equations for the projection variables: EAC, ETC, VAC, and TCPI. As with the previous sections, I’ve developed some tips and tricks to help you remember the required equations and easily populate the template.

Remember “Last – First – First” to Create the EAC Equation

Our goal is to create the EAC equation. EAC is the first equation in the bottom section of the template. To remember how to write the EAC equation, just memorize and repeat the following phrase:

- **Last – First – First**

“**Last**” refers to the last portion of the equation in the middle section of the template: “**EV / AC.**” While you do not reuse that equation exactly in the projections section, you do use the “EAC” letters that are contained within it.

“**First**” refers to the very first variable you entered at the top of the template: “BAC.”

The Second “First” refers to the first half of the equation that you wrote in the last cell of the middle section: “CPI.”


PM Master Prep		Earned Value Management Template	
BAC		Total budget	
PV		Work that <u>should</u> be done	
EV		What <u>is</u> done	
AC		Actual spend	
SV = EV – PV		CV = EV – AC	
		<div style="text-align: right;"> 3 First </div>	
SPI = EV / PV		CPI = EV / AC	
		<div style="text-align: right;"> 1 Last </div>	
		<div style="text-align: right;"> 2 First </div>	
		EAC = BAC / CPI	

Every Tabby Cat, Values Anchovy Caviar

Your next goal is to fill in the left side of the next two equations, Estimate To Complete (ETC) and Variance at Completion (VAC). If you look at the first letters of my ridiculous statement “Every Tabby Cat, Values Anchovy Caviar” you see the ETC and VAC.

- Every Tabby Cat = ETC
- Values Anchovy Caviar = VAC

I have no idea if the tabby cats actually do value anchovy caviar, but at least it helps us set up these two equations!

 Earned Value Management Template	
BAC	Total budget
PV	Work that <u>should</u> be done
EV	What <u>is</u> done
AC	Actual spend
SV = EV – PV	CV = EV – AC
SPI = EV / PV	CPI = EV / AC
<div style="border: 1px solid black; padding: 5px;"> <p>Fill in left side of next 2 equations</p> <p>ETC = <u>E</u>very, <u>T</u>abby, <u>C</u>at</p> <p>VAC = <u>V</u>alues, <u>A</u>nchovy, <u>C</u>aviar</p> </div>	EAC = BAC / CPI
	→ ETC =
	→ VAC =

Let's Dance: Do the EAC Slide and the BAC Hop!

Our next step is to fill in some of the variables that are in the new ETC and VAC equations we just started.

We are going to use new PMP dance moves I created to fill in those variables.

Do the "EAC Slide": Look down below, do you see how the EAC value from the top equation "slides" down from the top to the bottom on an angle? We are going to call that the "EAC Slide". By sliding that EAC down, you have the middle variable in the ETC equation and the last variable in the VAC equation!

PM Master Prep		Earned Value Management Template	
BAC		Total budget	
PV		Work that <u>should</u> be done	
EV		What <u>is</u> done	
AC		Actual spend	
SV = EV – PV		CV = EV – AC	
SPI = EV / PV		CPI = EV / AC	
<p style="text-align: center;"><u>Remember</u></p> <p style="text-align: center;">EAC follows a diagonal</p> <p style="text-align: center;">Negative signs in each equation</p>		EAC = BAC / CPI	
		ETC = EAC -	
		VAC = - EAC	

Do the “BAC Hop”: This really sounds like a dance move! Look below and find the BAC variable in the EAC equation.

The BAC hop is when the BAC value “HOPS” over the middle equation and plops down right in the middle of the VAC equation. Go ahead and follow the BAC as it hops down to the bottom equation. Make sure you say “Do the BAC hop!” while you trace the motion.

PM Master Prep		Earned Value Management Template	
BAC		Total budget	
PV		Work that <u>should</u> be done	
EV		What <u>is</u> done	
AC		Actual spend	
SV = EV – PV		CV = EV – AC	
SPI = EV / PV		CPI = EV / AC	
		EAC = BAC / CPI	
		ETC = EAC -	
		VAC = BAC - EAC	

Remember
BAC hops down to the bottom equation

***** One Last Thing: Don't forget to add the Subtraction Signs!!! *****


Both the ETC and VAC equations have a subtraction side in the middle. Take this time to insert that subtraction sign.

Almost Complete!

You are SO close to being done. One might say you are “Almost Complete”.

The words “Almost Complete” help me remember that **Actual Cost (AC)** is the last variable needed for the ETC equation. The words “Almost Cost” begin with same letters as the words “Almost Complete”...which is what your template is!

- **AC (Actual Cost) = “Almost Complete”**

 Earned Value Management Template	
BAC	Total budget
PV	Work that <u>should</u> be done
EV	What <u>is</u> done
AC	Actual spend
SV = EV – PV	CV = EV – AC
SPI = EV / PV	CPI = EV / AC
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p><u>Remember</u></p> <p>AC = “Almost Complete”</p> </div>	EAC = BAC / CPI
	ETC = EAC - AC
	VAC = BAC - EAC

I'm So Happy I Could Sing! Just Like Tommy Tutone (Google This Name RIGHT NOW!)

Did you google "Tommy Tutone"? Do it! Seriously. What song is he famous for?

Tommy Tutone is famous for a song named "867-5309". Take a break and listen to it (watch it on youtube)! I apologize in advance because the tune will be stuck in your head, but that's a good thing. I want you to hear the way Tommy sings "867-5309". We're going to use the same rhythm to remember how to create the **TCPI equation**.

Instead of singing "867-5309," **we are going to sing the following numbers to ourselves "8-1-3-1-4"**.

I stretch out that last four in a fun way...Eight – one – three – one – fourrrrrrrrr!). If you feel weird doing this, then you are doing it correctly!

Look at the annotated template below. You can see that the **specific numbers of 1, 3, 4, and 8 relate to the order in which we built the template**. BAC was the 1st thing we wrote, therefore it gets #1, EV was 3rd = #3.

The reason why I am having you sing this little tune is that 8-1-3-1-4 represents the order in which we write the TCPI equation variables on our template. Read the full TCPI equation at the bottom and then look for the cited numbers to see where and in what order each of the equation element is found: 8-1-3-1-4! See, I'm not totally crazy. This simple little tune will help you remember the complicated TCPI equation every time.

If you want to see ME sing 8-1-3-1-4, check out the video in the EVM Made Easy eCourse. We can sing together!

PM Master Prep		Earned Value Management Template	
①	BAC		Total budget
②	PV		Work that <u>should</u> be done
③	EV		What <u>is</u> done
④	AC		Actual spend
⑤	SV = EV – PV		⑦ CV = EV – AC
⑥	SPI = EV / PV		⑧ CPI = EV / AC
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>Remember</p> <p>8, 1, 3, 1, 4</p> </div>			
		EAC = BAC / CPI	
		ETC = EAC - AC	
		VAC = BAC - EAC	
		<p>⑧ ① ③ ① ④</p> <p>TCPI = (BAC – EV) / (BAC – AC)</p>	

Before we move on, you may ask “what about the other versions of the TCPI equation? Do I need to know those?”

You are correct that there are multiple equations for TCPI. All equations for TCPI define the CPI that must be achieved for the rest of the project in order to hit a management goal. The only difference is what the management goal is!

The two most common management goals are the BAC or EAC. **Please note that the template contains the equation for the assumption that BAC is the management goal.** This is the question you will face on the exam 99% of the time.

However, remembering the other equation is easy because the only difference in the two equations is if BAC or EAC is included in the denominator (the bottom). (I am showing you this to help you learn, but you will only need the equation on the template during the exam)

- **BAC: The efficiency that must be maintained to complete on plan (BAC)**
 - $TCPI = (BAC - EV) / (BAC - AC)$
- **Current EAC: The efficiency that must be maintained to complete the current EAC**
 - $TCPI = (BAC - EV) / (EAC - AC)$

However, remembering the other equation is easy because the only difference in the two equations is if BAC or EAC is included in the denominator (the bottom). (I am showing you this to help you learn, but you will only need the equation on the template during the exam)

Congrats you now know all the memory joggers to create my EVM template.

I have included a full list of the memory jogger on the next page!

Learning is fun, but mastery is our goal. In our next lesson you will start practicing creating the template on your own!

**Still kinda confused and want me to simplify everything
in fast, focused, easy to understand videos?**

Or Just want a laugh watching me sing?

Get access to the complete EVM Made Easy Course!



Memory Joggers:

- **B Pea, SC**
- **Follow the butterfly wings**
- **Last, First, First**
- **Every Tabby Cat,
Values Anchovy Caviar**
- **Let's Dance: EAC Slide / BAC Hop!**
- **Almost complete**
- **8, 1, 3, 1, 4**

PRACTICE MAKES PERFECT: PRACTICE CREATING THE TEMPLATE

Now it's time for you to put pencil to paper and try drawing and populating the template yourself. Practicing now is the only way to ensure that you can recreate the template on exam day.

The following exercises help you to progressively build your template-building skills. You will proceed through three levels of exercises and each level provides less and less support. When you can complete the third-level exercise, you will be able to create the template on your own with no reminders!

Remember, this is a new skill. The first few times you try to create the template you will forget things and make mistakes. Expect this and prepare to work through it. You can create the template from memory. It just takes a little time and focus to get the process down in your head.

Practice makes perfect and repetition keeps perfect. I want you to quickly create the template at least once per day, every day, in preparation for your exam. You will soon reach the point where you can recreate the template table and all of its equations without even thinking.

I have included sheets to help jumpstart your practice process. I organized these into three levels. Each level is provides less and less support. The goal is for you to methodically build your skills so that at the end you can create my EVM template with the **only two things you can bring into the exam, your brain and a smile!**

- Level 1: Fill in the template with the Memory Jogger
- Level 2: Fill in the template without the Memory Jogger
- Level 3: Fill in the template from memory (just your brain and a smile!)

Level 3: Fill in the Template from memory!

Practice #1

Level 3: Fill in the Template from memory!

Practice #2

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D Dominate

Using the Template on Exam Day

Practice Problems: Using the Template to Master EVM

Calculation Questions

Value Interpretation Questions

EVM Glossary

Magic Steps:

Tutorial.

Template.

Tear into

the exam.

It's Just that Simple.

DOMINATING EXAM DAY USING THE TEMPLATE

You have build your skills in constructing the template.

Before you start to practice solving questions using the my EVM question solving process, I want to explain how you will use the template on exam day. Following the process below will ensure that you get every EVM question correct.

Write down the EVM template (from memory) as soon as you are able to start the exam.

When you sit down to take the exam, the first thing you are required to do is to complete a tutorial on the computer testing program. This tutorial presents the rules of the testing center and teaches you how to operate the exam. This will take a few minutes. Be patient and pay careful attention to the tutorial.

As soon as you finish the tutorial, grab the pencil and scratch paper provided and create the template!

Please remember, you will not be able to bring anything into the exam. Instead, you will recreate the template from memory on the blank paper the exam center provides. This won't be a problem, however, because you will have mastered the quick creation of the template!

Keep your original EVM template CLEAN for use as a reference and do not use it to solve questions.

Once you create the template, put it to the side and DO NOT USE that version to solve actual EVM questions. Keep your original template pristine. Having a clean reference copy will prevent you from having to re-remember all the steps when it's time to create a template for every EVM question.

EVERY TIME you encounter an EVM question on the exam, copy the EVM template on a clean sheet of paper.

You will face multiple EVM questions on the exam. You need to work and solve each question on a separate piece of paper. This will allow you to remain organized and methodical as you solve each question. Additionally, this will help create a clean record of how you solved each question that you can use to double-check your answer.

Use the template and follow the three-step process to solve every EVM question on the exam.

Methodically follow the three steps below to solve each question:

1. Identify what the question is asking for
2. Define what is given
3. Follow the template path

Practice Problems

Calculation Questions

Interpretation Questions


**** Video Explanations ****

**Every Problem Explained in Depth by Me!
(In EVM Made Easy Course)**

Practice Problem #1

You have taken over a project that has been underway for three months. The most recent project report shows that \$75,000 has been spent to-date and the project was originally baselined to be completed in 9 months at a total cost of \$240,000. A thorough assessment of the work completed confirms that \$85,000 in project value has been delivered. Given what you have determined, what is the project's cost variance?

- a.) \$10,000
- b.) \$5,000
- c.) -\$5,000
- d.) -\$10,000

 Earned Value Management Template	
BAC	Total budget
PV	Work that <u>should</u> be done
EV	What <u>is</u> done
AC	Actual spend
$SV = EV - PV$	$CV = EV - AC$
$SPI = EV / PV$	$CPI = EV / AC$
	$EAC = BAC / CPI$
	$ETC = EAC - AC$
	$VAC = BAC - EAC$
	$TCPI = (BAC - EV) / (BAC - AC)$

Practice Problem #1: ANSWER


You have taken over a project that has been underway for three months. The most recent project report shows that \$75,000 has been spent to-date and the project was originally baselined to be completed in 9 months at a total cost of \$240,000. A thorough assessment of the work completed confirms that \$85,000 in project value has been delivered. Given what you have determined, what is the project's cost variance?

a.) \$10,000

b.) \$5,000

c.) -\$5,000

d.) -\$10,000

 Earned Value Management Template		
BAC	\$240,000	Total budget
PV	(3 / 9 months) (\$240,000) = \$80,000	Work that <u>should</u> be done
● EV	\$85,000	What <u>is</u> done
● AC	\$75,000	Actual spend
SV = EV – PV		★ CV = EV – AC
		CV = \$85,000 - \$75,000 CV = \$10,000
SPI = EV / PV		CPI = EV / AC
		EAC = BAC / CPI
		ETC = EAC - AC
		VAC = BAC – EAC
		TCPI = (BAC – EV) / (BAC – AC)

Practice Problem #2

You are the subcontractor on a large office renovation project responsible for installing energy efficient windows. The project baselines define that the project will be completed in 7 months with a total cost of the installation of \$450,000. After 4 months, fifty percent of the work has been completed and \$240,000 has been spent. What is the variance at completion?

- a.) -\$30,000
- b.) -\$20,000
- c.) \$20,000
- d.) \$30,000

PM Master Prep Earned Value Management Template	
BAC	Total budget
PV	Work that <u>should</u> be done
EV	What <u>is</u> done
AC	Actual spend
$SV = EV - PV$	$CV = EV - AC$
$SPI = EV / PV$	$CPI = EV / AC$
	$EAC = BAC / CPI$
	$ETC = EAC - AC$
	$VAC = BAC - EAC$
	$TCPI = (BAC - EV) / (BAC - AC)$

Practice Problem #2: ANSWER


You are the subcontractor on a large office renovation project responsible for installing energy efficient windows. The project baselines define that the project will be completed in 7 months with a total cost of the installation of \$450,000. After 4 months, fifty percent of the work has been completed and \$240,000 has been spent. What is the variance at completion?

a.) -\$30,000

b.) -\$20,000

c.) \$20,000


d.) \$30,000

 Earned Value Management Template		
BAC	\$450,000	Total budget
PV	(4 / 7 months) (\$450,000) = \$257,142	Work that <u>should</u> be done
● EV	(50%) (\$450,000) = \$225,000	What <u>is</u> done
● AC	\$240,000	Actual spend
SV = EV – PV		CV = EV – AC
SPI = EV / PV		● CPI = EV / AC
		CPI = \$225,000 / \$240,000 CPI = 0.9375
		● EAC = BAC / CPI
		EAC = \$450,000 / 0.9375 EAC = \$480,000
		ETC = EAC - AC
		★ VAC = BAC – EAC
		VAC = \$450,000 - \$480,000 VAC = -\$30,000
		TCPI = (BAC – EV) / (BAC – AC)

Practice Problem #3

Your project's total budget is \$500,000. Over the first seven weeks of the twenty-week project your team has completed 36% of the scheduled activities and spent \$200,000. Your director has continually emphasized that this project must finish on budget. At what CPI must the team operate with for the remainder of the project to ensure they finish on budget?


- a.) 0.9375
- b.) 1.00
- c.) 1.07
- d.) 1.17

 Earned Value Management Template		
BAC		Total budget
PV		Work that <u>should</u> be done
EV		What <u>is</u> done
AC		Actual spend
$SV = EV - PV$		$CV = EV - AC$
$SPI = EV / PV$		$CPI = EV / AC$
		$EAC = BAC / CPI$
		$ETC = EAC - AC$
		$VAC = BAC - EAC$
		$TCPI = (BAC - EV) / (BAC - AC)$

Practice Problem #3: ANSWER

Your project's total budget is \$500,000. Over the first seven weeks of the twenty-week project your team has completed 36% of the scheduled activities and spent \$200,000. Your director has continually emphasized that this project must finish on budget. At what CPI must the team operate with for the remainder of the project to ensure they finish on budget?


- a.) 0.9375
- b.) 1.00
- c.) 1.07**
- d.) 1.17

 Earned Value Management Template		
● BAC	\$500,000	Total budget
PV	(7 / 20 weeks) (\$500,000) = \$175,000	Work that <u>should</u> be done
● EV	(36%) (\$500,000) = \$180,000	What <u>is</u> done
● AC	\$200,000	Actual spend
SV = EV – PV		CV = EV – AC
SPI = EV / PV		CPI = EV / AC
		EAC = BAC / CPI
		ETC = EAC - AC
		VAC = BAC – EAC
		★ TCPI = (BAC – EV) / (BAC – AC)
		TCPI = (\$500,000 - \$180,000) / (\$500,000 - \$200,000) = 1.07

Practice Problem #4

Quality issues have plagued your project and caused costs to grow and the schedule to be delayed multiple times throughout the first four months of the twelve months of the schedule. During a recent project update meeting you communicated that the team has completed \$255,000 in value and spent \$325,000 to-date. Your sponsor is aware that the team is currently behind schedule and cost and will likely overspend the \$900,000 project budget. She has asked you to calculate the team's efficiency in completing the project work. What metric and value would you provide to the sponsor?


- a.) $SV = -\$40,000$
- b.) $SV = \$40,000$
- c.) $SPI = 0.78$
- d.) $SPI = 0.85$

 Earned Value Management Template		
BAC		Total budget
PV		Work that <u>should</u> be done
EV		What <u>is</u> done
AC		Actual spend
$SV = EV - PV$		$CV = EV - AC$
$SPI = EV / PV$		$CPI = EV / AC$
		$EAC = BAC / CPI$
		$ETC = EAC - AC$
		$VAC = BAC - EAC$
		$TCPI = (BAC - EV) / (BAC - AC)$

Practice Problem #4: ANSWER

Quality issues have plagued your project and caused costs to grow and the schedule to be delayed multiple times throughout the first four months of the twelve months of the schedule. During a recent project update meeting you communicated that the team has completed \$255,000 in value and spent \$325,000 to-date. Your sponsor is aware that the team is currently behind schedule and cost and will likely overspend the \$900,000 project budget. She has asked you to calculate the team's efficiency in completing the project work. What metric and value would you provide to the sponsor?

- a.) $SV = -\$40,000$
- b.) $SV = \$40,000$
- c.) $SPI = 0.78$
- d.) $SPI = 0.85$**

	Earned Value Management Template
---	---

BAC	\$900,000	Total budget
● PV	(4 / 12 months) (\$900,000) = \$300,000	Work that <u>should</u> be done
● EV	\$255,000	What <u>is</u> done
AC	\$325,000	Actual spend

$SV = EV - PV$	$CV = EV - AC$
★ $SPI = EV / PV$	$CPI = EV / AC$
$SPI = \\$255,000 / \\$300,000$ $SPI = 0.85$	

$EAC = BAC / CPI$
$ETC = EAC - AC$
$VAC = BAC - EAC$
$TCPI = (BAC - EV) / (BAC - AC)$

Practice Problem #5

You are the project manager of a 1,200-foot ocean pier construction project. The project management plan requires that you complete the project in 60 weeks at a cost of \$5,000 per linear foot. After the 24th week, your project analyst reports that the project's EV is \$2,400,000 and the total cost to date is \$2,000,000. If you assume that you will continue to spend at the same rate, what is the estimate to complete?

- a.) \$3,000,000
- b.) \$3,300,000
- c.) \$3,900,000
- d.) \$5,000,000

PM Master Prep		Earned Value Management Template	
BAC		Total budget	
PV		Work that <u>should</u> be done	
EV		What <u>is</u> done	
AC		Actual spend	
SV = EV – PV		CV = EV – AC	
SPI = EV / PV		CPI = EV / AC	
		EAC = BAC / CPI	
		ETC = EAC - AC	
		VAC = BAC – EAC	
		TCPI = (BAC – EV) / (BAC – AC)	

Practice Problem #5: ANSWER

You are the project manager of a 1,200-foot ocean pier construction project. The project management plan requires that you complete the project in 60 weeks at a cost of \$5,000 per linear foot. After the 24th week, your project analyst reports that the project's EV is \$2,400,000 and the total cost to date is \$2,000,000. If you assume that you will continue to spend at the same rate, what is the estimate to complete?

a.) \$3,000,000

b.) \$3,300,000

c.) \$3,900,000

d.) \$5,000,000

 **Earned Value Management Template**

BAC	1,200 ft x \$5,000 / linear ft = \$6,000,000	Total budget
PV	(24 / 60 weeks) (BAC) = \$2,400,000	Work that <u>should</u> be done
● EV	\$2,400,000	What <u>is</u> done
● AC	\$2,000,000	Actual spend

SV = EV – PV	CV = EV – AC
SPI = EV / PV	● CPI = EV / AC
	CPI = \$2,400,000 / \$2,000,000 CPI = 1.2

● EAC = BAC / CPI
EAC = \$6,000,000 / 1.2 EAC = \$5,000,000
★ ETC = EAC - AC
ETC = \$5,000,000 - \$2,000,000 EAC = \$3,000,000
VAC = BAC – EAC
TCPI = (BAC – EV) / (BAC – AC)

Practice Problem #6 - 8

Practice Problem #6:

You have recently taken over a project in the executing process group. You have been informed that the project has an SV of \$45,000 and a CV of -\$60,000. These results indicate that the project is in what condition?

- a.) Ahead of schedule and under budget
- b.) Ahead of schedule and over budget
- c.) Behind schedule and under budget
- d.) Behind schedule and over budget

Practice Problem #7:

In the creation of the communications management plan, your team defined a requirement that monthly updates be provided to key stakeholders that detail the expected cost to finish all of the remaining project work. Which of the following variables should the team calculate in order to meet the reporting requirements established?

- a.) Cost Variance (CV)
- b.) Variance at completion (VAC)
- c.) Estimate at completion (EAC)
- d.) Estimate to complete (ETC)

Practice Problem #8:

You are the project manager of a supply chain project. The project has a to-complete performance index (TCPI) of 1.1. What does this indicate in reference to the future performance of the project?

- a.) The project has extra funds at hand to complete additional work
- b.) Cost performance needs to be improved
- c.) Schedule performance needs to be improved more than cost performance
- d.) The project baseline should be adjusted

Practice Problem #9 - 10

Practice Problem #9:

Your cost analyst has calculated that your project has an estimate at completion of \$450,000. Given that you know that the project budget is \$425,000 what can you infer about the project's cost performance index results up to this point?

- a.) Cost performance index is below 1
- b.) Cost performance index is above 1
- c.) Cost performance index is 1
- d.) There is not sufficient information to infer

Practice Problem #10:

You are preparing to present your project's status during the monthly project review meeting. As of today, your project has an earned value (EV) of \$127,200, a planned value (PV) of \$143,000, and an actual cost (AC) of \$138,000. How will you explain the project's current schedule performance?

- a.) Project is behind schedule
- b.) Project is on schedule
- c.) Project is ahead of schedule
- d.) Schedule performance is within an acceptable range

Practice Problem #6 - 7: ANSWERS

Practice Problem #6:

You have recently taken over a project in the executing process group. You have been informed that the project has an SV of \$45,000 and a CV of -\$60,000. These results indicate that the project is in what condition?

- a.) Ahead of schedule and under budget
- b.) Ahead of schedule and over budget**
- c.) Behind schedule and under budget
- d.) Behind schedule and over budget

The positive schedule variance value (\$45,000) indicates that the project is ahead of schedule. The negative cost variance value (-\$60,000) indicates that the project is behind schedule.

Practice Problem #7:

In the creation of the communications management plan, your team defined a requirement that monthly updates be provided to key stakeholders that detail the expected cost to finish all of the remaining project work. Which of the following variables should the team calculate in order to meet the reporting requirements established?

- a.) Cost Variance (CV)
- b.) Variance at completion (VAC)
- c.) Estimate at completion (EAC)
- d.) Estimate to complete (ETC)**

The estimate to complete (ETC) value defines the expected cost to complete all remaining project work. e This value will provide the information needed to satisfy the reporting requirements.

The most common equation used to calculate estimate to complete, $ETC = BAC / CPI$.

Practice Problem #8 - 9: ANSWERS

Practice Problem #8:

You are the project manager of a supply chain project. The project has a to-complete performance index (TCPI) of 1.1. What does this indicate in reference to the future performance of the project?

- a.) The project has extra funds at hand to complete additional work
- b.) Cost performance needs to be improved**
- c.) Schedule performance needs to be improved more than cost performance
- d.) The project baseline should be adjusted

To-Complete Performance Index (TCPI) defines the CPI that must be achieved for the remainder of the project in order to meet a defined project goal. The TCPI of 1.1 indicates that the team must maintain a higher efficiency than originally defined when the project was baselined (baseline CPI = 1.0). The need for a TCPI of greater than 1 indicates that the historical performance has been below 1. For this reason the team must improve the cost performance on all future work.

Practice Problem #9:

Your cost analyst has calculated that your project has an estimate at completion of \$450,000. Given that you know that the project budget is \$425,000 what can you infer about the project's cost performance index results up to this point?

- a.) **Cost performance index is below 1**
- b.) Cost performance index is above 1
- c.) Cost performance index is 1
- d.) There is not sufficient information to infer

The estimate at completion (EAC) is the projected final amount that will be spent on the project given the cost performance registered up to this point. Logically, an EAC above the project budget indicates that the project has not historically spent resources efficiently, therefore a larger total amount will be required to complete all project work in the future.

Mathematically, the most common equation used to calculate the estimate to complete, $EAC = BAC / CPI$. The calculation below shows that an EAC higher than the BAC indicates that the CPI is below 1.

$$\begin{aligned} EAC &= BAC / CPI \\ \$450,000 &= \$425,000 / CPI \\ CPI &= \$425,000 / \$450,000 \\ CPI &= 0.944 \end{aligned}$$

Practice Problem #10: ANSWER

Practice Problem #10:

You are preparing to present your project's status during the monthly project review meeting. As of today, your project has an earned value (EV) of \$127,200, a planned value (PV) of \$143,000, and an actual cost (AC) of \$138,000. How will you explain the project's current schedule performance?

- a.) **Project is behind schedule**
- b.) Project is on schedule
- c.) Project is ahead of schedule
- d.) Schedule performance is within an acceptable range

The project is behind schedule.

This can be determined by comparing the value of the work that is done (EV) to the work that should be done (PV). Since a lower amount of work has been completed (EV) than should be done (PV) the project is behind schedule.

Additionally, the comparison of EV and PV is done through the Schedule Variance equation.

$$\begin{aligned}SV &= EV - PV \\SV &= \$127,000 - \$143,000 \\SV &= -\$16,000\end{aligned}$$

A negative SV confirms that the project is behind schedule.

Work Performance Data

BAC **Budget at Completion**
Total amount authorized for the project

PV **Planned Value**
Value of the work that should be done

EV **Earned Value**
Value of the work that is done

AC **Actual Cost**
Actual amount spent to complete the work

Variance & Performance Indexes

SV

Schedule Variance

Is the project ahead or behind schedule?

SPI

Schedule Performance Index

How efficiently is the team completing work?

CV

Cost Variance

Is there a budget deficit or surplus currently?

CPI

Cost Performance Index

How efficiently is the budget being spent?

Future Performance Forecasts

EAC

Estimate at Completion

What do we think will be the total cost to complete the project?

ETC

Estimate to Complete

Given the EAC, how much more must be spent to complete the remaining work?

VAC

Variance at Completion

How much more/less do we now expect to spend than the original budget?

TCPI

To-Complete Performance Index

What CPI must the team operate at to finish the project at the defined budget goal?



Congrats!
You're Ready
to Dominate EVM.

If you need any more help
reach out directly to me!

Seriously.

I'm one email away. Use it!

scott@pmmasterprep.com