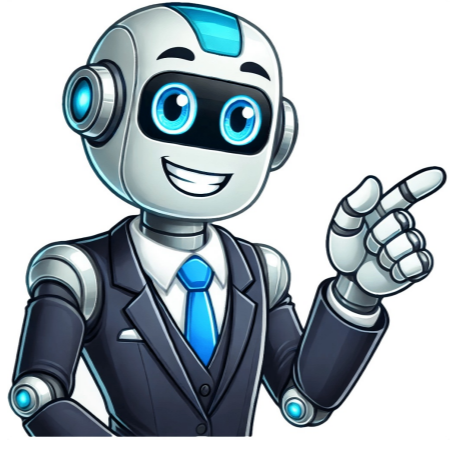


[Click Here](#)































As teachers, we plan every part of our lesson. But, do you think about the questions you want to ask while planning to help you meet the goals of your lesson? In this post, I share four types of math questions and discuss the importance of thinking about the questions you want to ask during the lesson planning process. Planning a single lesson can sometimes take hours. And, while we tend to be thoughtful about the activities we choose to do, we don't always take time to make intentional decisions about what kind of math questions to use during the lesson. It's easy to think we know what math questions to ask when we're teaching the lesson; however, if we don't plan for the questions in advance, we may miss important opportunities to help our students make connections and understand the content on a deeper level. Asking good math questions is essential to helping students make sense of math. When we make a plan for what questions to ask before the lesson begins, we take the time to consider how students will respond to the new material, what misconceptions students will develop, and what errors they will make. We can then use good math questions to address these areas. The National Council of Teachers of Mathematics (NCTM) states, "The effective teaching of mathematics uses purposeful questions to assess and advance students' reasoning and sense making" (p. 35). This means the questions we use must provide opportunities for students to explain and reflect on their thinking to gain a deeper understanding of and make connections between math concepts and skills. NCTM divides the types of questions teachers ask into four categories and recommends using all four types of questions during a lesson. This type of question establishes what students know and requires them to recall facts, math terms, or procedures. Examples of these types of questions include: In your own words, what question are you trying to answer? What information were you given in the problem? How does the information given help you determine your strategy? What information do you need to answer the question? What does \_\_\_\_\_ mean? These questions draw out student thinking and require students to explain, clarify, or elaborate on their thinking. This type of question includes communication about the steps necessary to find a solution or complete a task. Examples of these types of questions include: How might a visual, like a picture, a diagram, or a table help you show your work? What strategy are you going to use? Explain. How do you know where to start? Can you explain your steps? What's next? Will estimation help you find the answer? How will you know when you have found the answer? How will you order your steps? This type of question provides opportunities for students to explore the structure of mathematics, connect mathematical ideas, and look for relationships between concepts. Examples of these types of questions include: How does your strategy compare to \_\_\_\_\_'s strategy? What other math skills connect to this problem? How might what you learned here help you solve another problem? Where can you find this type of problem in the real world? These questions allow students to dig deeper and reveal their understanding of the concept or skill. They also allow students to highlight their reasoning and justify their actions. Examples of these types of questions include: Is your answer reasonable? How do you know? Will this strategy work in all cases? Can you find a counterexample? What changes did you have to make while you were trying to solve the problem? Will this method work with other numbers or in other situations? The types of math questions we ask and the manner in which we ask them is essential to developing student understanding. It's important we avoid funneling our questions, leading students to a predetermined procedure or outcome based on our thinking, and work toward focusing our questions to guide students using their own thinking and ideas. As you prepare for your next lesson, be sure to make a plan for the questions you will ask and think through the way your students may respond so that you have appropriate follow-up questions. Ready to get started? Download my good math questions guide using the form below. What tools do you use to plan for purposeful math questions during math talk? Share your thoughts in the comments section below. NCTM (2014). Principles to actions: Ensuring mathematical success for all. NCTM: Reston, V.A. 100%(1)100% found this document useful (1 vote)1K viewsThis document contains a list of over 150 essential questions for math education. It covers topics like numbers and operations, algebra, geometry, measurement, data, and statistics. The ques...Save 150 Essential Questions For Later100%100% found this document useful, undefined100%(1)100% found this document useful (1 vote)1K viewsThis document contains a list of over 150 essential questions for math education. It covers topics like numbers and operations, algebra, geometry, measurement, data, and statistics. The ques... Math problems can get really tough. And when they do, it is easy for students to get confused and lose sight of how mathematics connects to the real world and their lives. Math essential questions are a great way to help students connect mathematical ideas together, while grounding them in real life! But what exactly are math essential questions, and how do you create and ask them? Math essential questions are broad questions that can be asked in order to give direction to a unit or a series of lesson plans. Typically, teachers present essential questions to their class before a lesson begins. This gives students a deeper concept to anchor their understanding back to throughout each lesson. Often times teachers will work math essential questions into their lesson plans to prompt deeper thinking and to help students form connections between concepts and to the real world. As a unit moves forward, students gain more and more mathematical knowledge that they can use to help them explore the essential questions for the unit. Essential questions are also an effective way to help students develop a positive mathematical mindset and a positive relationship with mathematics. And when students have a growth mindset toward learning and mathematics, they are more likely to enjoy deeper learning that connects concepts to the real world! When students are presented with math essential questions, they are given a question that sparks their curiosity. Students can use essential questions as a challenge of sorts. Their task is to gather tools and knowledge from throughout the unit to help them answer and explore the essential question. Often times math essential questions do not have a single answer. Instead, students use the skills they develop from solving math problems to help them explore possible ways of answering the essential question. This can help students develop a deeper appreciation for knowledge in general, even across different subject areas. Imagine a unit that consists of a lesson on addition problems and a subtraction problem lesson. Students could connect these two lessons to a single essential question that prompts them to think about how these two basic operations are related to one another. For example: Why are opposites so important in mathematics? This question challenges students to form meaning and make connections between the steps involved in addition problems and a given subtraction problem. Addition and subtraction are no longer seen as permanent basic operations, but rather opposite sides of the same coin. There are many different ways that students and teachers can ask math essential questions in the classroom. In my experience, I find the best approach is to start with a specific math concept. I then expand further to focus on the concept in general. From there, I ask about connections to other mathematics concepts or math in the real world. In the example above, addition and subtraction were the specific concepts before generalizing to opposites. From there, we ask about their role in mathematics in general. Check out the following 20 examples of math essential questions across various math subject areas! How can mathematics be used to understand and compare real world scenarios? How can mathematics be used to describe patterns and make predictions? What mathematical tools are available to help us make good decisions in the real world? What approach do effective problem solvers use? How does mathematics help develop strong communication? How do diagrams help us make sense of real world problems? How does proving theorems deepen our understanding of geometry? What makes geometry postulates, theorems, and properties so important in mathematics? How are geometric properties useful in modeling and describing real world phenomena? How can two-dimensional shapes be used to visualize and understand three-dimensional shapes? Why is accuracy important when using measurement? How can equations be used to solve real-world problems? How are solutions to equations and inequalities both similar and different? How are patterns useful in the real world? How accurate are mathematical models, and can they be used in real life? Why is data collected, and how is it used? How reliable are conclusions that are made from analyzing data? How much confidence do we need to have in a mathematical conclusion? How can probability be used to predict the likelihood of a real world event? Should statistics always be trusted? There are many different ways that essential questions can be used in a mathematics classroom. Teachers that are looking for bulletin board ideas in their classroom will find value in placing a unit's essential question in a highly visible area of the classroom. Other teachers use these questions as reflective journal prompts to help students consolidate their learning at the end of a lesson. Regardless of how they are used, math essential questions are a powerful tool that can help students deepen and enrich their learning of mathematics. When used correctly, these powerful questions can help students gain an entirely new appreciation for mathematical knowledge and its use in their lives. So next time a student asks for examples of algebra in everyday life, turn it into an essential question conversation! Did you find this overview of essential questions helpful? Share this post and subscribe to Math By The Pixel on YouTube for more helpful mathematics content! AlgebraCalculusGeometryMath Mindset Math problems can get really tough. And when they do, it is easy for students to get confused and lose sight of how mathematics connects to the real world and their lives. Math essential questions are a great way to help students connect mathematical ideas together, while grounding them in real life! But what exactly are math essential questions, and how do you create and ask them? Math essential questions are broad questions that can be asked in order to give direction to a unit or a series of lesson plans. Typically, teachers present essential questions to their class before a lesson begins. This gives students a deeper concept to anchor their understanding back to throughout each lesson. Often times teachers will work math essential questions into their lesson plans to prompt deeper thinking and to help students form connections between concepts and to the real world. As a unit moves forward, students gain more and more mathematical knowledge that they can use to help them explore the essential questions for the unit. Essential questions are also an effective way to help students develop a positive mathematical mindset and a positive relationship with mathematics. And when students have a growth mindset toward learning and mathematics, they are more likely to enjoy deeper learning that connects concepts to the real world! When students are presented with math essential questions, they are given a question that sparks their curiosity. Students can use essential questions as a challenge of sorts. Their task is to gather tools and knowledge from throughout the unit to help them answer and explore the essential question. Often times math essential questions do not have a single answer. Instead, students use the skills they develop from solving math problems to help them explore possible ways of answering the essential question. This can help students develop a deeper appreciation for knowledge in general, even across different subject areas. Imagine a unit that consists of a lesson on addition problems and a subtraction problem lesson. Students could connect these two lessons to a single essential question that prompts them to think about how these two basic operations are related to one another. For example: Why are opposites so important in mathematics? This question challenges students to form meaning and make connections between the steps involved in addition problems and a given subtraction problem. Addition and subtraction are no longer seen as permanent basic operations, but rather opposite sides of the same coin. There are many different ways that students and teachers can ask math essential questions in the classroom. In my experience, I find the best approach is to start with a specific math concept. I then expand further to focus on the concept in general. From there, I ask about connections to other mathematics concepts or math in the real world. In the example above, addition and subtraction were the specific concepts before generalizing to opposites. From there, we ask about their role in mathematics in general. Check out the following 20 examples of math essential questions across various math subject areas! How can mathematics be used to understand and compare real world scenarios? How can mathematics be used to describe patterns and make predictions? What mathematical tools are available to help us make good decisions in the real world? What approach do effective problem solvers use? How does mathematics help develop strong communication? How do diagrams help us make sense of real world problems? How does proving theorems deepen our understanding of geometry? What makes geometry postulates, theorems, and properties so important in mathematics? How are geometric properties useful in modeling and describing real world phenomena? How can two-dimensional shapes be used to visualize and understand three-dimensional shapes? Why is accuracy important when using measurement? How can equations be used to solve real-world problems? How are solutions to equations and inequalities both similar and different? How are patterns useful in the real world? How accurate are mathematical models, and can they be used in real life? Why is data collected, and how is it used? How reliable are conclusions that are made from analyzing data? How much confidence do we need to have in a mathematical conclusion? How can probability be used to predict the likelihood of a real world event? Should statistics always be trusted? There are many different ways that essential questions can be used in a mathematics classroom. Teachers that are looking for bulletin board ideas in their classroom will find value in placing a unit's essential question in a highly visible area of the classroom. Other teachers use these questions as reflective journal prompts to help students consolidate their learning at the end of a lesson. Regardless of how they are used, math essential questions are a powerful tool that can help students deepen and enrich their learning of mathematics. When used correctly, these powerful questions can help students gain an entirely new appreciation for mathematical knowledge and its use in their lives. So next time a student asks for examples of algebra in everyday life, turn it into an essential question conversation! Did you find this overview of essential questions helpful? Share this post and subscribe to Math By The Pixel on YouTube for more helpful mathematics content! AlgebraCalculusGeometryMath Mindset