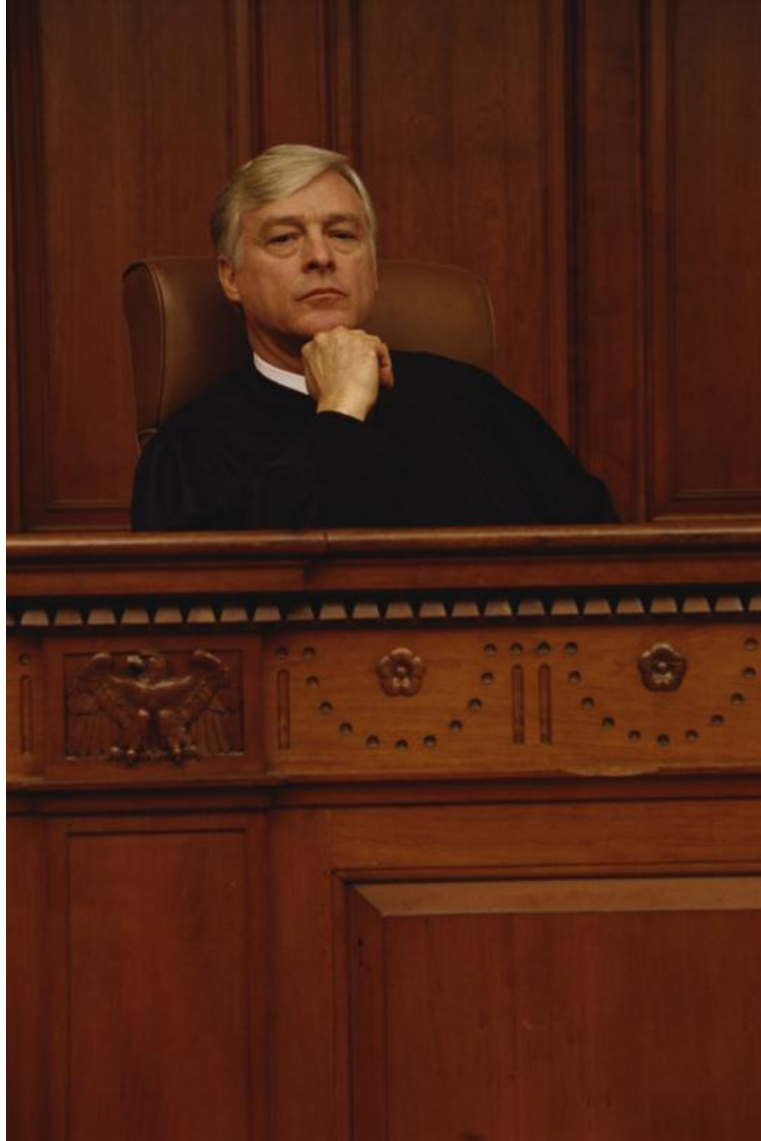


## Mars Rover Model Celebration – Lesson Plan



**valid:**  
something that is reasonable or makes sense

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### Introduction:

One of new vocabulary word for this unit is **valid**. Valid has several meanings, but in today's lesson, it means "something that is reasonable or makes sense". Valid does not necessarily mean true. Scientists often don't know whether the hypotheses they make or the questions they ask are true until they conduct experiments to test them. However, when scientists develop their questions, they think about everything they already know so that their questions and guesses are valid (and not silly). Today you will be asked to come up with a valid question for your Mars Rover mission.

Let's look at a picture that will help us understand the meaning of the word valid. Judge Bell is hearing a case in his courtroom. He is listening to the arguments the lawyers make to see if they are valid. Each lawyer will say things that are "reasonable and make sense" to explain their arguments. Judge Bell will then determine which lawyer has made the most reasonable – or valid - arguments and decide the case in their favor.

### Example:

Let me give you another example of the meaning of the word valid. Suppose you REALLY want to ride your bike to the park. You know that your mom might have a valid (reasonable) concern about your safety, so you begin to think about valid (reasonable) things that you can suggest doing so that she will not be as worried and might let you ride your bike to the park. You will carefully think out what her concerns are and what you can do to make her feel less worried. If you craft valid reasons for allowing you to go to the park, you will have a better chance of convincing her that it would be okay. For example, a valid thing that you could say to your mom to address her concerns might be that you will wear your helmet.

### Reflection:

I am going to say some sentences. If the sentence is an example of "something reasonable or that makes sense", put your thumbs up and say VALID. If the sentence is not reasonable, put your thumbs down and say NOT VALID.

- A student tells his teacher that he forgot his homework because an alien ate it (NOT valid)
- A scientist argues that astronauts won't need to bring food to the Moon on future missions because the Moon is made out of cheese. (NOT valid)
- A student tells the principal that he could not have stolen a book because he went home early the day the book disappeared. (valid)
- A teacher tells students that scientists only send spacecraft to Mars once every two years because the planets are too far apart the rest of the time. (valid)

### Make it personal:

Think of the example I gave you earlier about wanting to ride your bike to the park. Think about why your mom might be worried about you going. Then consider valid things you could suggest doing to make her less worried and let you go on your bike. Share your ideas with your neighbor. Start your sentence with "My mom will worry that \_\_\_\_\_. A valid thing that I could suggest so she will feel less worried would be \_\_\_\_\_. " I will ask some of you to share your ideas.

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(Possible ideas if students have difficulty coming up with them -- ride only on sidewalks, go with at least one other friend, agree on a time that you will be home, wear a watch so you know the time and can be home on time, promise you will only go straight to the park and then home – not stopping anywhere along the way, if you have a cell phone – that you will call her when you get there, check in every 30 minutes, and call her when you are leaving)