## Episode 4

## TWO TRUTHS \& A LIE!

Warm Up
The purpose of this activity is to engage students' prior knowledge. It is okay if students can not complete the entire table.
Instructions: Before watching the video, fill out the table below with what you know about the following International System of Units (SI) measurements. For example, what do the units measure? What tools use those measurement units?

| Kelvin (K) | Kelvin measures temperature. A tool that uses Kelvin is a thermometer. |
| ---: | :--- |
| kilogram (kg) | The kilogram measures mass. Tools that students could list include: scale, spring scale |
| second (s) | The second measures time. Tools that students could list include: clock, watch, timer, and stopwatch |
| meter (m) | The meter measures length. Tools that students could list include: ruler, tape measure, meter stick |

## Video Questions

Instructions: While watching the video, complete the exercises below.

1) Write a "T" next to each statement that you think is true, and an " $F$ " next to each statement you think is false.

| a.) Scientists no longer need an object in Paris, France to tell them how <br> much mass is in a kilogram. | T |
| :--- | :--- |
| b.) The object which defines the mass of a kilogram is made <br> out of diamonds. | F |
| c.) The object which defines the mass of a kilogram has had different <br> names over the years, like Grave, Gramme, and Le Grand K. | T |

2) Explain which statement about the kilogram is false and why.
$B$ is false. The object which was previously used to determine the mass of a kilogram was made of metal (platinum and iridium). If students have watched Video 3 and completed the corresponding reading/worksheet, they should know that it was made from metal.
3) Write a "T" next to each statement that you think is true, and an "F" next to each statement you think is false.

| a.) Until the American Revolution, Americans used sundials to tell time. | F |
| :--- | :--- |
| b.) The current definition of the second comes from vibrations on a tiny atom. | T |
| c.) As clocks improved, people started to divide time into smaller chunks. | T |

4) Explain which statement about the second is false and why.

A is false. By the 1700 s/18th century, Americans had clocks.
5) Write a "T" next to each statement that you think is true, and an "F" next to each statement you think is false.
a.) A meter is longer than a yard
b.) In the past, people used their hands, arms, and feet to define length.
c.) A meter is constantly stretching and compressing based on the changing speed of light.
6) Explain which statement about the meter is false and why.

C is false. The speed of light is constant, which means it does not change.
Since the meter is defined by the speed of light, its length does not change.

By broadcasting a precise stream of invisible microwaves, Professor Second has the power to fix any clock. A second is the time it takes for $9,192,631,770$ "wiggles" from her cesium atoms to pass through a fixed point!

## Post Video Questions

Answers will vary. Students might refer to what the unit measures, the tools that
Instructions: After watching the video, complete the table below. measure it, or information about its history.

| What did you learn about the <br> SI units we studied today? |  | What questions do you have about <br> the SI units we studied today? |
| :--- | :--- | :--- |
| kilogram (kg) |  |  |
| second (s) |  |  |
| meter (m) |  |  |

