**Student Worksheet: Scaling the world’s largest telescope**

**Directions:** Read the *Science News* article “[How giant mirrors are made for what will be the world’s largest telescope](https://www.sciencenews.org/article/giant-mirrors-magellan-largest-telescope)” and answer the questions according to your teacher’s instructions.

**Defining scale**

1. Define scale and give an example. How can you use it to make sense of objects you haven’t seen?

2. Choose two objects in your classroom and create a scale that relates them to each other.

3. Come up with a scale for an object. Choose a celestial object, a part of the body that is invisible to the naked eye, an unfamiliar county’s size (or anything else that is unfamiliar to you) and compare it to a more familiar object.

**The Magellan telescope and scale**

1. Write down some examples of scale that the article’s author used to explain the size of the Magellan telescope’s mirror.

2. How are literary devices used to describe the scale? Name at least one literary device used and highlight the sentence that uses it.

3. What is another way you could help a reader better understand the size of the mirror for the Magellan telescope? Come up with your own way of representing the scale of the mirror.

**Solving for scales**

1. The article states that the mirror has a “surface so smooth that if it were expanded to the size of North America, the tallest imperfection would be half as tall as a golf tee.” Given an average golf tee height of 3 inches (2.54 centimeters = 1 inch) and an area of North America of approximately 24.23 million square kilometers (km2), estimate the height of the tallest imperfection of the polished mirror at its current size. Give your answer in meters, then convert it to nanometers. Show your work.

2. Why do you think the author of the article explained the size of the imperfection using an analogy instead of stating the exact size? Explain.

3. Read through the article again and write down all examples of scales not related to the size of the Magellan telescope that you can find (there are many!).

4. What’s another quantity or value given in the article that is difficult to grasp in terms of its magnitude? Devise your own way of helping a reader understand the quantity or value given by writing a literary device that scales the amount or size to something more familiar or by providing a diagram.



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