

MYP10u10 - Worksheet: Powers of Ten – Scales of the Universe

Watch the video "Scales of the Universe in Powers of Ten" and answer the questions below.

1. What is meant by a "power of ten" in this context?
2. How does the scale of a human compare to the universe and to atoms?
3. What structures are visible at the 10^3 meter scale (1,000 meters)?
4. What astronomical features become visible at scales of 10^6 meters and above?
5. What is the estimated size of the observable universe shown in the video?
6. What happens when we zoom in below 1 meter to the microscopic scale?
7. At what point do individual cells and organelles become visible?
8. How are atoms and subatomic particles represented in the inner zoom?
9. What scientific fields are relevant at different scales shown (e.g., astronomy vs. biology vs. particle physics)?
10. How does this visualisation help us understand our place in the universe?

Quiz: Choose the correct answer for each question.

1. At what scale (in meters) does a human appear in the video?

- A. 10^0
- B. 10^2
- C. 10^1
- D. 10^3

2. Which structure is visible around the 10^6 meter scale?

- A. A cell
- B. A human
- C. A city
- D. A planet

3. At what scale do atomic structures become visible?

- A. 10^{-3}
- B. 10^{-6}
- C. 10^{-10}
- D. 10^{-1}

4. What is visible at the 10^9 meter scale?

- A. Solar system
- B. Molecule
- C. Person
- D. Cell

MYP10u10 - Worksheet: Powers of Ten – Scales of the Universe

5. Which of these would be seen at 10^{-4} meters?
- A. Bacteria
 - B. Atom
 - C. Tree
 - D. Planet
6. At which scale do planets become clearly visible?
- A. 10^6
 - B. 10^1
 - C. 10^{10}
 - D. 10^{-6}
7. What type of science studies structures at 10^{-10} meters?
- A. Astronomy
 - B. Biology
 - C. Chemistry
 - D. Geology
8. What is the outer limit of the observable universe, as shown?
- A. 10^{24}
 - B. 10^{15}
 - C. 10^{10}
 - D. 10^6
9. At what point do organelles inside cells become visible?
- A. 10^{-6}
 - B. 10^{-3}
 - C. 10^0
 - D. 10^3
10. Which of the following best represents the purpose of the video?
- A. To show galaxies
 - B. To explain biology
 - C. To illustrate scale
 - D. To study atoms
-