

## Perimeter Dark Matter Online Game

### Worksheet #2

1. Match the following game graphics to their descriptions:

a. Black hole



b. Dark matter



c. Star



d. Brown dwarf



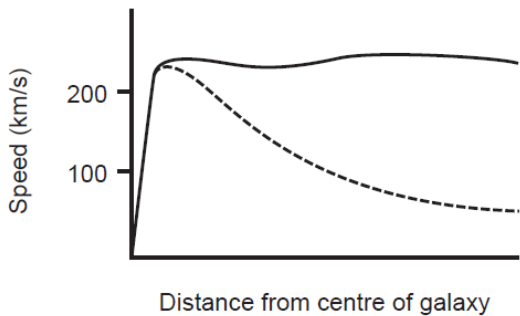
2. In the game, if a galaxy is too bright, you can:

- a. Add dark matter
- b. Remove dark matter
- c. Add stars
- d. Remove stars

3. Scientists observed the speeds of stars in galaxies were:

- a. Faster than theory predicted
- b. Slower than theory predicted
- c. In agreement with theory

4. The following graph is:



- a. Observed speeds
- b. Expected speeds

5. Which of the following is true?
  - a. Physicists know exactly what dark matter is.
  - b. Physicists have no idea what dark matter is.
  - c. Only some physicists know what dark matter is made of.
  - d. Physicists have some ideas about dark matter, which they are currently testing by experiments.
  
6. What can you add to a galaxy that increases mass and brightness?
  
  
  
  
  
  
  
  
  
  
7. "Doppler shift" was used to determine the speeds of stars. Briefly explain red-shift and blue shift.
  
  
  
  
  
  
  
  
  
  
9. What force is responsible for the centripetal acceleration of both planets around the sun and stars around the center of their galaxy? Explain.
  
  
  
  
  
  
  
  
  
  
10. What properties of dark matter make it a possible solution to the discrepancy between theory and observation?