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Activities

Free Falling

Name: _____ Date: _____

Gravity isn't really switched off when astronauts float around inside their spaceship, as some people think. The secret is in their free fall. Find out more in this Planet Diary activity.

Directions

- Start with this video of Fun in Space. Answer Workspace question 1.
- The astronauts appear to be "weightless." Are they really? Go to Gravity Creates Weightlessness? Read the first paragraph. View the animation and read the explanation. Answer question 2.
- How do orbiting spaceships avoid free falling to Earth? Look closely at the second animation. Read the first two red bullets, then answer question 3.
- Let's give the spaceship some horizontal velocity. Click the up-arrow below the spaceship one click at a time. Give the spaceship enough horizontal velocity to avoid crashing into Earth. Notice what happens to vertical acceleration (free fall rate). Read the third and fourth bullets, then answer question 4.
- How does horizontal velocity affect the shape of the spaceship's orbit? Increase the horizontal velocity to the maximum, then answer question 5.
- Watch these science teachers romping in the Zero Gravity Classroom. Answer the last question.

Workspace

1. Describe what the video shows.

2. Why do astronauts experience the sensation of weightlessness in their spaceship?

3. What happens when the spaceship in the animation has zero horizontal velocity?

4. How is vertical acceleration (free fall) linked to the sensation of "weightlessness"?

5. What happens when you increase the horizontal velocity to the maximum?

6. How are "zero gravity" conditions created in simulated free fall?

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