Name: _____ Date: _____

A Fleck of Paint Can Chip a Window

Circle group

Around Earth, thousands of old objects race through space. There are pieces of used rockets, satellites that no longer work, and tiny flecks of paint. People call this clutter space junk.

Space junk matters because of its speed. Things in orbit move many times faster than a fast airplane. At that speed, even a fleck of paint hits with great force. Spacecraft windows have been chipped by bits smaller than a grain of sand. Bigger pieces could do much more harm.

To keep watch, people use radar and telescopes. Teams on the ground track the bigger pieces and keep a list of where each one goes. If a piece will pass close to a working satellite or the space station, controllers can fire small engines to move the spacecraft away.

Some junk does not stay up forever. Things in low orbits slowly rub against the thin top layer of air and sink lower. Most of them burn up when they fall into thick air. Higher orbits can hold junk for a very long time.

Engineers now build satellites that move out of orbit when their work is done. Cleaning up in space matters, just like cleaning your room.

Questions

1. What is space junk?

_____

_____

2. Why can a tiny fleck of paint do damage?

_____

_____

3. How do people keep watch on space junk?

_____

_____

4. What can controllers do if junk will pass close to a satellite?

_____

_____

5. Why does junk in low orbits not stay up forever?

_____

_____

6. How do engineers help clean up in the future?

_____

_____

Words to know

satellites: machines that circle Earth in space
clutter: a messy pile of things that are not needed
orbit: the path an object takes as it circles a planet
radar: a tool that uses radio waves to find where objects are
controllers: people who direct and guide a machine from far away

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

A Fleck of Paint Can Chip a Window

Triangle group

Around Earth, thousands of old objects race through space. There are pieces of used rockets, satellites that no longer work, and tiny flecks of paint that have flaked off. People call this clutter space junk.

Space junk matters because of its speed. Objects in orbit move many times faster than a speeding airplane. At that speed, even a fleck of paint can hit with a lot of force. Spacecraft windows have been chipped by objects smaller than a grain of sand. Larger pieces could do much more harm to a satellite or a spaceship.

To keep watch, people use radar and telescopes. Teams on the ground track the larger pieces and keep a list of where each one is headed. If a piece is going to pass close to a working satellite or to the space station, controllers can fire small engines to move the spacecraft out of the way.

Some junk does not stay up forever. Objects in low orbits slowly brush against the thin top layer of air and sink lower. Eventually, most of them burn up as they fall into the thick air. Higher orbits, though, can hold junk for a very long time.

Engineers are now building satellites that move themselves out of orbit when their work is finished. Cleaning up after ourselves in space is just as important as cleaning up our rooms at home.

Questions

1. What is space junk?

_____

_____

2. Why can a tiny fleck of paint cause damage?

_____

_____

3. How do people keep watch on space junk?

_____

_____

4. What can controllers do if a piece of junk will pass close to a satellite?

_____

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5. Why does junk in low orbits not stay up forever?

_____

_____

6. How are engineers helping to clean up in the future?

_____

_____

Words to know

satellites: machines that circle Earth in space
clutter: a messy pile of things that are not needed
orbit: the path an object takes as it circles a planet
radar: a tool that uses radio waves to find where objects are
controllers: people who direct and guide a machine from far away

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

A Fleck of Paint Can Chip a Window

Square group

Encircling Earth, thousands of discarded objects hurtle through space. They include fragments of spent rockets, satellites that have stopped working, and minuscule flecks of paint that have peeled away. People refer to this clutter as space junk.

Space junk is a serious concern because of its tremendous speed. Objects in orbit travel many times faster than a speeding airplane. At such velocities, even a fleck of paint can strike with considerable force. Spacecraft windows have been chipped by particles smaller than a grain of sand, and larger fragments could inflict far greater damage on a satellite or a spaceship.

To keep watch, specialists rely on radar and telescopes. Teams on the ground follow the larger pieces and maintain a catalog of where each one is headed. Whenever a piece is predicted to pass close to a working satellite or to the space station, controllers can fire small engines to maneuver the spacecraft out of harm's way.

Some of this junk does not remain aloft forever. Objects in low orbits gradually brush against the thin upper layer of air and spiral lower and lower. Eventually, most of them burn up as they plunge into the thick atmosphere. Higher orbits, however, can hold junk for an extremely long time.

Engineers are now designing satellites that move themselves out of orbit once their work is finished. Cleaning up after ourselves in space is every bit as important as tidying our rooms at home.

Questions

1. What is space junk?

_____

_____

2. Why can a tiny fleck of paint cause damage?

_____

_____

3. How do specialists keep watch on space junk?

_____

_____

4. What can controllers do if a piece of junk will pass close to a satellite?

_____

_____

5. Why does junk in low orbits not remain aloft forever?

_____

_____

6. How are engineers helping to clean up in the future?

_____

_____

Words to know

satellites: machines that circle Earth in space
clutter: a messy pile of things that are not needed
orbit: the path an object takes as it circles a planet
radar: a tool that uses radio waves to find where objects are
controllers: people who direct and guide a machine from far away

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: A Fleck of Paint Can Chip a Window

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: A Fleck of Paint Can Chip a Window

Easier · 198 words · Flesch-Kincaid grade 4.3

1. Old rocket pieces, dead satellites, and flecks of paint in orbit around Earth.
2. It moves so fast that it hits with great force.
3. With radar and telescopes.
4. Fire small engines to move the spacecraft away.
5. It rubs against the thin top layer of air, sinks lower, and burns up.
6. They build satellites that move out of orbit when their work is done.

Triangle: A Fleck of Paint Can Chip a Window

This passage · 230 words · Flesch-Kincaid grade 5.5

1. Old rocket pieces, dead satellites, and flecks of paint in orbit around Earth.
2. It moves so fast that it hits with a lot of force.
3. With radar and telescopes.
4. Fire small engines to move the spacecraft out of the way.
5. It brushes against the thin top layer of air, sinks lower, and burns up.
6. They build satellites that move themselves out of orbit when their work ends.

Square: A Fleck of Paint Can Chip a Window

Harder · 240 words · Flesch-Kincaid grade 8.5

1. Fragments of old rockets, dead satellites, and peeled flecks of paint in orbit around Earth.
2. It travels so fast that it strikes with considerable force.
3. With radar and telescopes.
4. Fire small engines to maneuver the spacecraft out of harm's way.
5. It brushes against the thin upper layer of air, spirals lower, and burns up.
6. They design satellites that move themselves out of orbit once their work is finished.