Nasa urged to clean up growing cloud of space junk

Under threat ... the International Space Station Getty Images

**Before reading**

1. Look at the photo, headline and caption of the article. Answer the questions.
   a. What is the current problem in space?
   b. Who is being asked to solve the problem?
   c. What is in danger?
2 Match one adjective to each noun. Discuss with a partner how these phrases might be part of the news story.

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**Article**

Nasa urged to clean up growing cloud of space junk

1 The amount of junk in space is rising exponentially, with continuous collisions between abandoned equipment, spent rockets and other debris creating ever growing clouds of dangerous fragments, an influential report has warned.

2 The report, commissioned by Nasa, says the quantity of hazardous material circling the Earth has reached a “tipping point” and poses a real and increasing danger to satellites and the International Space Station.

3 It suggests developing a clean-up strategy which could include catching debris with nets, magnets or giant umbrellas.

4 “The current space environment is growing increasingly hazardous to spacecraft and astronauts,” said Donald Kessler, chair of the committee responsible for the report and a retired head of Nasa’s orbital debris programme.

5 Objects in space ranging from the huge upper stages of Russian rockets to tiny particles of liquid coolant are tracked by ground based radars operated by Nasa and other space agencies. About half a million fragments and objects larger than a centimetre are in low orbit around Earth.

There are tens of millions of particles larger than a millimetre.

6 Even minute specks of debris can cause serious damage to spacecraft and satellites because of the immense speeds at which they travel.

7 The quantity of debris in space more than doubled after China destroyed an orbiting weather satellite with a missile in 2007 as part of an anti-satellite test, and the collision between two satellites over Siberia in 2009.

8 Since the Nasa space shuttle was retired, there are no tried and tested means to remove defunct satellites and other space junk from orbit.

9 Several companies are exploring ways to clean up the space environment, with techniques that range from capturing the junk in lightweight nets to launching probes that latch on to debris and steer it into the atmosphere, where it will burn up.

10 Satellite and spacecraft manufacturers routinely build additional shields to protect against debris, but there is a trade-off between safety and weight. The International Space Station (ISS) has shields designed to withstand strikes from centimetre-sized objects.

11 Mission controllers can alter the orbits of the ISS and some satellites to avoid collisions, but this is not always effective.

**Ian Sample**

**Glossary**

- **exponentially** (adverb) when a rate of increase is becoming faster and faster
- **spent** (adjective) when a rocket or bullet has been used and it can’t be used again
- **defunct** (adjective) no longer operating
- **probe** (noun) a spacecraft without people on board
- **withstand** (verb) to be strong enough not to be damaged by extreme conditions or strong force
While reading

1 Read the article. Choose the correct answers.
   a Collisions between items of space debris have resulted in ...
   b the threat of fragments hitting the Earth.
   c a rapidly increasing amount of junk in space.
   d a slowly growing cloud of space junk.

2 The strategy for cleaning up the space junk ...
   a has recently been planned by Nasa.
   b is being designed by Donald Kessler.
   c must include the use of giant magnets.
   d hasn't been fully decided at present.

3 The very tiny pieces of junk in orbit ...
   a cannot easily be tracked by Nasa.
   b can be a real danger to spacecraft.
   c are mostly particles of liquid coolant.
   d are often from huge Russian rockets.

4 The only proven way of removing satellites ...
   a is with a lightweight net.
   b is with a special type of probe.
   c was with the former space shuttle.
   d was with the retired Nasa space probe.

5 Companies that make satellites and spacecraft ...
   a usually put extra shields on them.
   b are unable to put safety shields on them.
   c put technology on them to avoid space junk.
   d put controls on them to alter the orbit.

2 Read the article again and answer the questions.
   a What examples are mentioned of the type of junk found in space?

   b What solutions are mentioned to clean up the junk?
After reading

1 Word building. Use the words below to complete the text. You will need to put the words in a different form.
circle, collide, destroy, hazard, increase, safe
International space agencies are becoming
(a) ________________ concerned about the
(b) ________________ of the International Space
Station and other satellites because of the large
number of objects (c) ________________ the
Earth.
The (d) ________________ nature of the space
environment was highlighted in 2009 when there
was a (e) ________________ between the Russian
Cosmos satellite and the US Iridium satellite 789km
above Siberia. Both satellites were completely
(f) ________________ on impact and their debris
greatly added to the existing quantity of space junk.

2 What do these words and phrases from the article mean?
a ... creating ever growing clouds of dangerous
fragments ... (paragraph 1)
b ... the Earth has reached a “tipping point” ... (para 2)
c ... objects in space ranging from huge rockets ... to tiny
particles ... (para 5)
d ... there are no tried and tested means to remove ...
(par 7)
e ... but there is a trade-off between safety and weight.
(par 9)

Activity - discussion
The future of the space environment
In small groups discuss the questions and note ideas. At the end, share answers with the rest of the class.
a How might everyday life be affected if satellites are
destroyed by space junk?
b Why might near space become increasingly
important to us in the years to come?
c How can we stop countries or organisations from
leaving junk in space?