

Teacher's Guide for Ask: Too Small to See

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Betty Lou Askin, a retired educator, who resides in Toronto Ontario, prepared this guide.

Scoops (page 2)

- What is FLIP?
- What do scientists usually study while on FLIP?
- Describe the importance of FLIP.
- Explain why you think that this type of ship was designed.

Power Curtain (page 3)

- What makes solar textiles?
- Explain why this is a terrific new invention.

A World of Their Own (page 3)

- Describe why you think it has been important to keep the existence of these people a secret?
- Can you think of another group of people whose existence changed because other people came to know about them? Explain how their lives changed.

Nestor's Dock (pages 4-5)

- Do you think gummy worms are a worthy reward for collecting real worms?
- Explain why Phil is a hero.

The Search for the Small (pages 6-13)

- Why is it important to find the smallest thing on Earth?

The Biggest Smallest Thing

- What is "beggar's dust"?

The Universe Gets Smaller...

- What new inventions came about in the 1600s?
- Why was Antonie van Leeuwenhoek an important non-scientist?
- What is an animacule?
- Do you think that bacteria are important to our lives? Explain your choice.

Make a Water Drop Microscope

- Explain why the water drop helps make a microscope.

...And Smaller

Ideas that may be used to assist with discussions-

- Explain why Democritus was 'a man ahead of his time'.
- Why did the scientists of the 1800s begin to understand the smallest particles?
- Explain why a grain of sand can be considered as a large particle.

- What is a molecule?
- Explain why J.J. Thomson was both right and wrong in his theory.

The Smallest Things – So Far

Some questions to help with the content information-

- Why do you think Thomson “started something”?
- What is an atom?
- What is a quark?
- What are fundamental particles?
- What is a “particle zoo”?
- Why would they call it a “particle zoo”?

Make It Small

- What is nanotechnology?
- Describe the work that nanoengineers are trying to accomplish.
- What is a particle accelerator?
- In your own words explain the following quote. “The smaller we get, the bigger the questions become.”

Mini Monsters (pages 14-19)

Questions/activities to use-

- What is a microorganism?
- Explain how the dirt dwellers help the ecosystem.
- Choose one of the aquatic creatures and describe how its body is suited to life in the water.
- Why does this article say that we have a personal zoo?
- Choose one of the mini creatures and do some further research about it. Share your findings with the rest of the class.

From the Field Journal of Dr. Luke N. Fursumting (pages 20-21)

- Why is this article a very clever piece of work?
- Use this same style of writing to describe some of the things that are in your princely bedroom, house or classroom.

Is Anybody Out There? (pages 22-27)

Questions to consider-

- Explain how scientists think that life began on Earth.
- What is an extremophile?
- Why is liquid water so important?
- What work do astrobiologists conduct?
- Where else do scientists believe there may be life besides on Earth?
- What was significant about the white cubes found on Mars?
- Explain the possible reason for the cracks on Europa.
- Describe how gravitational pull might explain that there are other planets.
- What is a planet’s transit system?
- How do radiotelescopes work?
- What are scientists hoping to hear?

Jimmy the Bug

- Use your own words to explain why a ball bounces.
- What is the difference between a hard object and a soft object when you bounce them?

Marvin and Friends

- Explain to Plush how she has her own personal zoo.

Creative Ideas

- Use the idea suggested on page 27 to send a message to an Alien.
- Conduct an interview with an Alien from another planet/galaxy.
- Write a newspaper article telling about life on another planet.
- Make posters of people or creatures from another galaxy.
- Choose one very small thing that you read about in the magazine. Prepare a news report about your chosen thing and accompany the report with pictures.