

The Goldilocks Principal

Have you heard the fairy tale called Goldilocks and the three bears? If not, watch the video about the story from www.missdoctorbailer.com and then answer the following questions.

1. Why is the girl called Goldilocks? _____
2. The porridge that she ate was not too hot, not too cold, it was _____.
4. The chair that she sat in was not too big, it was _____.
5. The bed she slept on was not too hard, not too soft, it was _____.

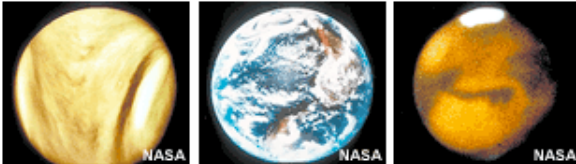
On earth, two elements, nitrogen and oxygen make up about 99% of the air we breathe. Most of the remaining 1% is the gas Argon. There are trace gasses (Carbon dioxide and methane) that are known as greenhouse gasses because they act as a barrier to heat leaving the atmosphere. So they trap heat and give us the greenhouse effect. Many people think of the greenhouse effect as something bad, but if we didn't have these gasses the earth would not be warm enough for us to live on.

We can evaluate the effect of greenhouse gasses by comparing Earth with its closest neighbors - Venus and Mars. These planets either have too much greenhouse effect or too little to sustain life as we know it. The differences between the three planets have been named the "Goldilocks Principal" because Venus is too hot, Mars is too cold, but Earth is just right.

Materials: 5 colors of jellybeans, beans or pony beads, 3 re-sealable plastic bags per group

What To Do:

1. Look at the table below.

			
	Venus	Earth	Mars
Carbon Dioxide (CO ₂)	96.5%	0.03%	95%
Nitrogen (N ₂)	3.5%	78%	2.7%
Oxygen (O ₂)	Trace	21%	0.13%
Argon (Ar)	0.007%	0.9%	1.6%
Methane (CH ₄)	0	0.002%	0

2. Start with 100 and determine the number of each item needed to represent the atmosphere for each planet.
3. Place the correct number of items in the bag for each planet.
4. Use the following code for each gas:
Nitrogen - red Oxygen - green
Argon - purple Carbon dioxide - yellow
Methane - white

Questions:

1. Name two ways that the atmospheres of Venus and Mars are similar to each other. _____
2. Name one way that both differ from Earth's. _____
3. Why is Earth called a Goldilocks planet? _____



Watch the NASA video, “Getting to Know the Goldilocks Planet” from www.missdoctorbailer.com and answer the following questions.

1. What is the name of the spacecraft that is finding all the new planets? _____
2. What two characteristics are needed to be the Goldilocks Planet? _____
3. Why does being too close to a star prevent an Earth-sized planet from being the Goldilocks Planet? _____

Read the following article from Scholastic in the News and answer the questions.

The Goldilocks Planet

Scientists discover a planet that could be "just right" for human life

By [Tyrus Cukavac](#) | October 6, 2010

Could humans ever live on another planet? For many years, scientists have searched for a planet that could support human life like Earth. Last Wednesday, two scientists revealed that they may have found one. It's named Gliese 581g.

The planet is named after Wilhelm Gliese, the German astronomer who first mapped out stars close to Earth in 1957. He found a lot of them, so this solar system's sun is named Gliese 581. Gliese 581g is named "g" because it's the seventh planet discovered in this solar system, and "g" is the seventh letter of the alphabet. But that's a mouthful, so people have already nicknamed this home-away-from-home the Goldilocks planet.

Why? While other planets in this solar system are too cold or unbearably hot, this planet may be just right. The distance between Goldilocks and its star puts the planet inside a temperature zone that works well for humans—like Earth's distance from the sun in our

own solar system. This also means the planet might contain liquid water, an essential ingredient for life.



It is also believed to have a rocky surface, gravity, and even an atmosphere. Sounds like our planet, right? These characteristics might seem normal to us Earthlings, but scientists have not found many planets that share similarities with Earth.

One key difference between Goldilocks and Earth is that Goldilocks is "tidally locked" to its sun. That means one side of the planet always faces its sun, making that side extremely hot. The other side of the planet is exposed only to the darkness of outer space, making that side extremely cold. So, only a thin portion on the border of the two halves might be suited for life.

Still, Steven Vogt, one of the scientists who discovered Goldilocks, thinks this space is enough. "I would say that the chances for life on this planet are 100 percent."

Even if this particular planet turns out to be a dud, its discovery is a good sign that there might be other Earthlike planets in space. Another planet in the system, Gliese 581d, might also be capable of supporting life. There are a total of 116 stars in Earth's stellar neighborhood, and scientists have examined only nine of them extensively enough to determine whether their orbiting planets could support life. For all we know, the next Earthlike planet might be right around the galactic corner!

Questions:

1. What is the name of the new planet? _____
2. Why does it have the letter g after it's name? _____
3. What does “tidally locked” mean? _____
4. Where could liquid water be present on this planet? _____
5. What is important about liquid water? _____



Name _____ period _____

EXIT TICKET

The Goldilocks Principal

1. What do greenhouse gases do?
 - A. make greenhouses to grow plants
 - B. trap heat in the atmosphere
 - C. cause it to be too cold
2. Which planet in our solar system has too many greenhouse gasses to sustain life?
 - A. Venus
 - B. Earth
 - C. Mars
3. Which planet in solar system has too few greenhouse gases to sustain life?
 - A. Venus
 - B. Earth
 - C. Mars
4. Why is earth considered a Goldilocks Planet?
 - A. It has too many greenhouse gases life
 - B. It is neither too hot nor too cold for life
 - C. It has too few greenhouse gasses for life
5. If a planet is too close to its star why would it not be considered a Goldilocks Planet?
 - A. It would be too hot for liquid water needed for life.
 - B. It would be too cold for liquid water needed for life.
 - C. The greenhouse gasses would not work well.



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