

## Consult 4 Kids Lesson Plans

<b>Component</b>	Science
<b>Grade Level</b>	K-5
<b>Lesson Title</b>	Amazing Gravity
<b>Focus</b>	Incredible Stories (Fact is Stranger Than Fiction)

**Materials:** Newspaper, two oranges, grape, empty water bottles, several ketchup packets, cup of water

### Opening

#### State the Objective

The study of Science offers incredible stories. The objective of this activity is to experiment with weight and the force of gravity.

**Gain prior knowledge by asking students, “What do you know about \_\_\_\_\_?”**

Ask students, “Does the weight of an object affect how fast gravity pulls the object to Earth?” (No matter how much an object weighs, gravity pulls it downward at the same speed.)

### Content (the “Meat”)

#### Instruction / Demonstration (“I do” – “We do”)

1. Place newspaper on the floor.
2. Hold one orange in each hand. Extend your arms. Each orange must be at the same height.
3. Let the oranges go at the same time. Observe which one lands first.
4. Repeat the activity but this time hold an orange in one hand and a grape in the other.
5. Observe which one lands first.
6. What are the variables in this activity? What could cause either one to land before the other?

#### \*Activity → Teachable Moment(s) throughout

Tip: Teachers, listen for questions that begin with “what” or “how.”

- **Student:** “What will happen if we drop a feather and the lead sinker from the same height at the same time?”
- **Leader:** “How will the atmosphere affect the feather?”

#### Students Practice (“You Do”) “Anti-Gravity Ketchup Trick”

1. Materials: bottle of water, ketchup packet (Found at fast-food stores), glass of water.
2. Take the label off the bottle. Find a packet of ketchup that is not too full. To be sure you’re using one that will float, test out a few packets using a glass of water.
3. Fold the ketchup packet in half and push it into the bottle. It should float. Screw the cap back onto the bottle.
4. Pick up the bottle and hold it at the bottom with your right hand. If you lightly squeeze the bottle, the packet will fall to the bottom. If you release the pressure, it

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<p>will float back to the top! The trick is to squeeze the bottle while pretending to control the movements with a wave of your other hand.</p>	
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### Closing

#### Review

**Sample Review:** "We watched two oranges fall to the floor, and then we watched an orange and grape fall to the floor. The best part was when we performed the Anti-Gravity Magic Trick with a water bottle."

**Review:**

#### Debrief

**WHI?**

Ask the following three questions:

1. What happened after the orange and grape fell to the newspaper?
2. How would you explain the Anti-Gravity Magic Trick?
3. Which one of these activities will you use in your real life?

#### Reflection (Confirm, Tweak, Aha!)

**Sample Reflection:** "I'm not sure how squeezing the water bottle makes the catsup raise and lower in the water bottle."

**Your Reflection:**

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<b>Component</b>	Science
<b>Grade Level</b>	K-5
<b>Lesson Title</b>	Balance and Gravity Test
<b>Focus</b>	Incredible Stories (Fact is Stranger Than Fiction)

**Materials:** Large index card, pattern of a clown, pencil, scissors, markers, paper clips, string, several large balloons, water, string

### Opening

#### State the Objective

The study of Science offers incredible stories. The objective of the first activity is to see how symmetry can work with gravity to create balance. The second activity attempts to show to actual shape of the Earth.

**Gain prior knowledge by asking students, “What do you know about \_\_\_\_\_?”**

Ask students, “Can you make an upside-down clown balance on the eraser of a pencil? If it is possible then, what will gravity have to do with the activity?”

### Content (the “Meat”)

#### Instruction / Demonstration (“I do” – “We do”)

1. Talk about symmetry. (An object that is exactly the same on both sides.) Look for symmetrical objects around the room.
2. Use the clown pattern provided.
3. Fold the index card in half. Draw half of the clown. The fold line in the middle of the card is the middle of the clown.
4. Cut out the clown, and unfold the paper. Decorate.
5. Attach a paper clip to each arm for weight.
6. Try balancing the clown on the eraser top of a pencil.
7. Try balancing the clown with just one paper clip on one arm, and see if there is a different effect.

#### \*Activity → Teachable Moment(s) *throughout*

Tip: Teachers, listen for questions that begin with “what” or “how.”

- **Student:** “What caused the clown to fall with just one paper clip?”
- **Leader:** “How is the clown balanced with a paper clip on one side?”

#### Students Practice (“You Do”) “The Shape of the Earth”

1. Do this activity outside.
2. Provide partner-pairs with a large balloon, source of water, and a piece of string.
3. Fill the balloon with water. Tie the end with string.
4. The shape students have just made is an oblate sphere. Imagine a flattened sphere or ball. Earth also has this shape, although not quite as extreme as the shape of the balloons.

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### Closing

#### Review

**Sample Review:** “We balanced a paper clown on the end of a pencil eraser. Then we filled balloons with water.”

**Review:**

#### Debrief

##### Liked Best, Next Time (LBNT)

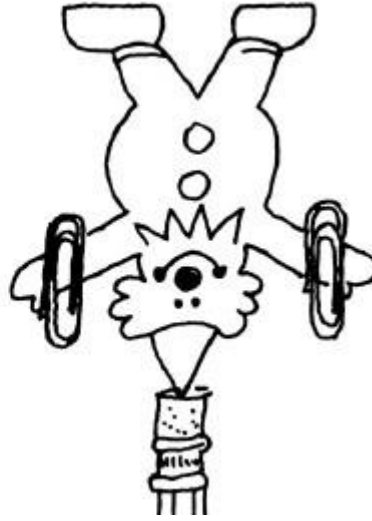
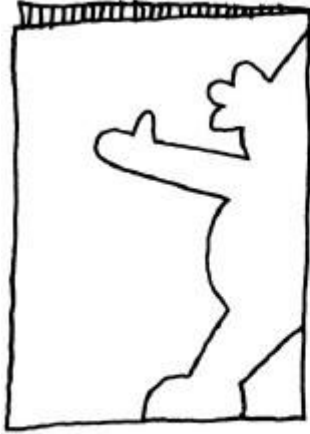
In this simple debrief, students talk about the activity or the day and share what they enjoyed most. Have them share what else they would have liked to have done, or what they would have liked to have spent more time on. LBNT allows students to express an opinion about the day.

##### Reflection (Confirm, Tweak, Aha!)

**Sample Reflection:** “It is difficult for me to imagine that the Earth is shaped like a pear.”

**Your Reflection:**

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<b>Component</b>	Science
<b>Grade Level</b>	K-5
<b>Lesson Title</b>	Gravity Free Water
<b>Focus</b>	Incredible Stories (Fact is Stranger Than Fiction)

**Materials:** A glass filled right to the top with water, a piece of cardboard, several balloons, flexible straws

### Opening

#### State the Objective

The study of Science offers incredible stories. Students will learn that water in a glass, held upside down, can defy gravity. Students will learn that you can suspend balloons in mid-air.

**Gain prior knowledge by asking students, “What do you know about \_\_\_\_\_?”**

Ask students, “Is it possible for water to stay in a glass while being held upside down?” (Yes, with the help of a piece of cardboard and air pressure.) “Would this experiment work with other liquids?”

### Content (the “Meat”)

#### Instruction / Demonstration (“I do” – “We do”)

1. Put the cardboard over the mouth of the glass. Make sure that no air bubbles enter the glass as you hold onto the cardboard.
2. Over a sink, or outside, turn the glass upside down.
3. Take your hand away holding the cardboard.
4. You may need to try this activity several times until you get it mastered.

#### Students Practice (“You Do”) “Suspending Balloons in Mid-Air”

1. Blow up your first balloon. Place the longest end of the straw in your mouth and the bent up end of the straw pointing toward the sky.
2. Hold your balloon just above the bent end of the straw.
3. Blow through the straw and see if you can suspend the balloon in mid-air.
4. If you are feeling confident, blow up the second balloon making sure that it is slightly bigger than the first balloon that you blew up.
5. Place the second balloon just above your first balloon to see if you can get both balloons to stay afloat, one on top of the other.
6. If you have managed this, go for your third balloon making sure that it is slightly bigger than the second balloon that you blew up.
7. Place your third balloon just above the second balloon to see if you can suspend it in air.

#### \*Activity → Teachable Moment(s) throughout

Tip: Teachers, listen for questions that begin with “what” or “how.”

- **Student:** “What does air pressure have to do with the water staying in the glass?” (With no air in the glass, the air pressure from outside the glass is greater than the pressure of the water inside the glass. The extra air pressure manages to hold the cardboard in place, keeping you dry.)

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### Closing

#### Review

**Sample Review:** "We kept water in a glass without it spilling to the ground. We also suspended two balloons in mid-air."

**Review:**

#### Debrief

##### Four Step Debrief (DIGA)

**Step 1:** Describe: Students describe what they did during the activity.

**Step 2:** Interpret: Students answer one, some or all of the following questions

- a. What were your key learning's when you participated in this activity?
- b. What skills did you need to utilize to participate in this activity?
- c. How did you feel participating in this activity?

**Step 3:** Generalize: How can you use the skills of your key learning's in your life?

**Step 4:** Apply: How can you use the skills in your work as an adult?

##### Reflection (Confirm, Tweak, Aha!)

**Sample Reflection:** "We all got out of breath trying to keep the balloons in the air by blowing through the straw."

**Your Reflection:**

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<b>Component</b>	Science
<b>Grade Level</b>	K-5
<b>Lesson Title</b>	Gravity Pulls
<b>Focus</b>	Incredible Stories (Fact is Stranger Than Fiction)

**Materials:** Lead sinker (fishing line weight), ball, pitcher, books, small cans or plastic cups, string

### Opening

#### State the Objective

The study of Science offers incredible stories. The objective of this activity is to explore the force of gravity.

#### Gain prior knowledge by asking students, “What do you know about \_\_\_\_\_?”

Ask students, “What would happen if there was no gravity? If gravity did not exist, what would happen to you, tables, chairs, food and everything? Where would all of the people and things go? (Floating around in space) Could you drink out of a cup? (No) Could you drink out of a straw? (You would need air pressure.)

Gravity keeps the planets and stars of the Milky Way in their place. Gravity acts the same way on objects of differing size and weight.

### Content (the “Meat”)

#### Instruction / Demonstration (“I do” – “We do”)

1. Prop a table up by placing some books under one end of it, about 2 in.
2. Observe the speed of the ball as it rolls down the table.
3. Throw a ball into the air and observe its path.
4. At a sink, over a bucket, or outside, pour water from the pitcher and again observe its path.
5. The paths of these objects are called parabolic. (A curve formed by the intersection of a cone with a plane parallel to its side. Think of a basketball court. The “key” under the net is outlined in a parabola; also, the arch in the McDonald’s Sign)
6. Now drop the lead sinker and the ball. Observe the difference.

#### \*Activity → Teachable Moment(s) throughout

Tip: Teachers, listen for questions that begin with “what” or “how.”

- **Student:** “What will happen if water spilled in a ‘no gravity zone?’ Could you collect the water and put it back in the cup?”
- **Leader:** “What is the name of the man who discovered many things about gravity?” (Sir Isaac Newton)

#### Students Practice (“You Do”) “Whirl the Water Can”

1. Attach a piece of string to a small can or plastic cup.
2. Half fill the can (cup) with water.
3. Do not put the lid back on the can (cup).
4. In an outside area swing the can around your head very quickly.
5. What will happen?



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<ol style="list-style-type: none"> <li>6. Does the water stay in the cup? What keeps the water in the cup? When you stop swinging the cup, why does the water fall out?</li> <li>7. Think about a ride at the County Fair or Amusement Park, sometimes called a "Gravitron." You stand at the edge of a circular device. As it begins to spin faster and faster, you are pinned to the wall around the edges of the ride. What is this force? (centrifugal force) Is this the same thing as gravity? (This ride is used to create artificial gravity.)</li> <li>8. Can you think of other examples of centrifugal force? (Banked curves when driving)</li> </ol>	
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<b>Closing</b>
<b>Review</b>
<p><b>Sample Review:</b> "We watched a ball roll, a ball being thrown up in the air and water being poured. Next we watched a cup half full of water being swung around by a string."</p> <p><b>Review:</b></p>
<b>Debrief</b>
<p><b>Three Questions</b></p> <p>Ask the following three questions:</p> <ol style="list-style-type: none"> <li>1. What was the most important thing you learned from this activity?</li> <li>2. How can you use what you have learned in your real life?</li> <li>3. How would you show this activity to another person?</li> </ol>

<p><b>Reflection (Confirm, Tweak, Aha!)</b></p> <p><b>Sample Reflection:</b> "This activity taught the students that gravity will hold water in a cup when it is twirled around your head."</p> <p><b>Your Reflection:</b></p>
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<b>Component</b>	Science
<b>Grade Level</b>	K-5
<b>Lesson Title</b>	Seasons and Tides
<b>Focus</b>	Incredible Stories (Fact is Stranger Than Fiction)

**Materials:** Balloon with a line drawn around the middle (Earth and its equator), bowl (to rest Earth on), flashlight (the Sun), books to rest flashlight on; bucket, plastic ball or balloon, water

### Opening

#### State the Objective

The study of Science offers incredible stories. Students will learn how the Earth experiences different seasons, and how the ocean has high and low tides.

**Gain prior knowledge by asking students, “What do you know about \_\_\_\_\_?”**

Ask students, “Does the light from the Sun fall evenly on the Earth? Where is the hottest part of the planet?”

### Content (the “Meat”)

#### Instruction / Demonstration (“I do” – “We do”)

1. Blow up the balloon. Tie off the end.
2. Draw a black line around the center of the balloon (equator).
3. Slowly spin Earth around.
4. Sit Earth onto the bowl so the line of the equator is slightly sloping toward the flashlight.
5. Rest the flashlight onto the books so it is shining just above the equator.
6. Where the Sun’s light is brightest, the countries will be experiencing summer. Where the Sun’s light is furthest away, the countries will be experiencing winter.
7. Talk about where winter, autumn and spring would be?
8. Discuss which colors of clothing you should wear in summer. (Light colors reflect the light and heat to keep you cooler) Which colors should you wear in winter? (Dark colors absorb the light and heat to keep you warm)
9. Would it be possible to live where there is summer all year long? (Yes, just follow the equator from one end to the other.)
10. Does this make sense to do in real life?

#### \*Activity → Teachable Moment(s) throughout

Tip: Teachers, listen for questions that begin with “what” or “how.”

- **Student:** “How can the equator be the hottest part of the planet?”
- **Leader:** “What part of the Earth is closest to the Sun?” (The equator)

#### Students Practice (“You Do”) “The Tides”

1. Half fill the bucket of water.
2. Place the ball in the bucket so it is floating.
3. Place both hands onto the ball and push down very slowly.
4. Let the ball come up again.
5. Watch the change in water level.

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| <p>6. How can you tell if the tide is coming in or out? (Every twelve hours the tides rise and fall. As the Earth and Moon spin, gravity pulls them together and the Moon pulls at the ocean water directly beneath it causing it to rise and fall. When it is high tide on one side of Earth, it will be low tide on the other side.)</p> <p>7. When is the best time to go fishing? High tide or low tide? (The best time to go fishing is one hour before high or low tide, and one hour after high or low tide. There is less water movement at that time. Expert fishermen say that in the early hours before sunrise and after sunset are the best times for fishing.)</p> |  |
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### Closing

#### Review

**Sample Review:** “We learned all about the seasons. We learned how the moon pulls the water on Earth to make high tide.”

**Review:**

#### Debrief

**What’s So Important About That?**

This strategy takes a single student’s learning and thinking deeper. Students are reminded of what they just participated in. The first question asking students generically, what is important about (whatever they just finished). When one student responds, listen for what the student says is important about the activity that was just completed. Building on that statement, the question is again, “What’s so important about that?” This process can take up to five times. At the end, the leader says, “So what I’m hearing you say is that it is important to . . . “

#### Reflection (Confirm, Tweak, Aha!)

**Sample Reflection:** “I liked learning about the seasons. When it is winter here, I think I will go to Australia for summer.”

**Your Reflection:**

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<b>Component</b>	Science
<b>Grade Level</b>	K-5
<b>Lesson Title</b>	The Moving Sun and Sunset in a Box
<b>Focus</b>	Incredible Stories (Fact is Stranger Than Fiction)

**Materials:** Chalk, 2 friends, pen, paper, watch; several clear plastic boxes, water, milk, several flashlights, several plastic teaspoons

### Opening

#### State the Objective

The study of Science offers incredible stories. Students will learn how the Sun moves through the day, and why the sky changes color at sunset.

#### Gain prior knowledge by asking students, “What do you know about \_\_\_\_\_?”

Ask students, “Does the Sun move through the sky or does the Earth move through the sky?”  
 Ask students, “Are there dust particles in the atmosphere? (Yes) How do you know this is true? (They are visible when the wind is blowing. You can see them on a car or in the house on the furniture.) These tiny dust particles scatter the Sun’s light. The yellow and red light of the Sun is harder to scatter, so that is why we see those colors during a sunset.

### Content (the “Meat”)

#### Instruction / Demonstration (“I do” – “We do”)

**WARNING: Never stare directly at the Sun as it may cause eye damage!**

1. Choose three times of the day to go outside and measure shadows. The best times are mid-morning, noon, and mid-afternoon.
2. Before you go outside, record the three times you will be outside in a table.
3. With your partners, go outside with your chalk and your recording table.
4. Take turns to draw each other’s shadows on the concrete.
5. Draw what your shadow looks like in your recording table. Draw a line through the middle of your shadow.
6. Go out for your second observation and stand in exactly the same place as you did earlier. Trace around your shadow and draw a line down the middle of it. Record this on your table.
7. Do this for your third observation.
8. Compare the lines down the middle of each shadow. What do you notice?

#### \*Activity → Teachable Moment(s) throughout

Tip: Teachers, listen for questions that begin with “what” or “how.”

- **Student:** “What if we can only go outside two times and draw our shadows?”
- **Leader:** “Can we still get information about the path of the Earth from two shadows?”

#### Students Practice (“You Do”) “Sunset in a Box”

1. Divide students into small groups.
2. Fill your clear plastic box with water.

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| <ol style="list-style-type: none"> <li>3. Add a teaspoon of milk to the water.</li> <li>4. Shine a flashlight straight down to see what the Sun looks like at midday.</li> <li>5. Shine the flashlight sideways to see what the Sun looks like as it sets.</li> <li>6. Do you see red and yellow colors?</li> </ol> |  |
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### Closing

#### Review

**Sample Review:** "We learned that our shadows change size during the day. We also learned that dust moves the Sun's light around."

**Review:**

#### Debrief

##### Three What's

Ask the following three "what" questions:

1. What did you enjoy most about this activity?
2. What happened after we finished drawing the shadows?
3. What did you learn from the group?

##### Reflection (Confirm, Tweak, Aha!)

**Sample Reflection:** "I learned that nothing is ever the same, even our shadows."

**Your Reflection:**

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<b>Component</b>	Science
<b>Grade Level</b>	K-5
<b>Lesson Title</b>	The Sun, Earth and Moon
<b>Focus</b>	Incredible Stories (Fact is Stranger Than Fiction)

**Materials:** Several large balloons, modeling clay, straw, several pieces of elastic, cut in various lengths

### Opening

#### State the Objective

The study of Science offers incredible stories. The objective of this activity is to see the relationship between the Sun, Earth and the Moon, and how incredible it would be if the Sun was not a part of the solar system.

#### Gain prior knowledge by asking students, “What do you know about \_\_\_\_\_?”

Ask students, “Does anyone have a sweater big enough to fit a small planet? Would we be able to live on Earth if someone turned the Sun off?”

Without the Sun there would be no life on Earth. The Sun provides light, warmth, and energy. The Sun is much bigger than any of the planets in our solar system. Compared to Earth, the Sun is 100 times bigger in diameter, 330,000 times heavier and a million times bigger in volume.

### Content (the “Meat”)

#### Instruction / Demonstration (“I do” – “We do”)

1. Blow up a large balloon as big as possible and tie the balloon closed.
2. Make two round balls with the modeling clay. One about the size of a ping-pong ball (Earth) and the other a little smaller in size than a small marble (Moon).
3. Slide the straw through the middle of the larger ball and the through the middle of the smaller ball.
4. Position the balloon about three feet from the Earth and Moon.
5. Ask students to comment on what they see.

#### Students Practice (“You Do”) “Whirl the Ball”

1. Experience the pull of gravity.
2. Talk about safety during the lesson. Students should find a safe place to whirl the balloon.
3. Whirl a balloon on the end of a piece of elastic.
4. The stretch of the elastic represents the gravitational pull of the Sun.
5. The planets are kept in place by the pull of gravity.
6. The further the planet is from the Sun the longer it takes to orbit (travel) around the

#### \*Activity → Teachable Moment(s) throughout

Tip: Teachers, listen for questions that begin with “what” or “how.”

- **Student:** “Does the Sun rotate around the Earth and Moon?” (No)
- **Leader:** “How many days does it take for the Earth to rotate around the Sun?” (365 days)

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Sun. Have students make a list of all the planets. (Mercury, Venus, Earth, Mars, Jupiter, Uranus and Neptune) Have students decide which piece of elastic represents each planet. Note: Pluto at one time was considered a planet. With the advances of space telescopes, it is now **not** considered a planet.

### Closing

#### Review

**Sample Review:** "First we made a model of the Sun, Earth and Moon. Then we attached a piece of elastic to a balloon and whirled it around."

**Review:**

#### Debrief

**WHI?**

Ask the following three questions:

1. What were some of the questions that came up in your group?
2. How did you go about including everyone?
3. If you were to try this again, what might you do differently?

#### Reflection (Confirm, Tweak, Aha!)

**Sample Reflection:** "This activity taught the students that the Sun is absolutely essential to life on Earth."

**Your Reflection:**

#### Modification of Lesson:

The leader may need to model the pull of gravity activity before students work in small groups.

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<b>Component</b>	Science
<b>Grade Level</b>	K-5
<b>Lesson Title</b>	Your Weight on the Moon and Gazing at Stars
<b>Focus</b>	Incredible Stories (Fact is Stranger Than Fiction)

**Materials:** Bathroom scales, calculators; balloons, waterproof markers

### Opening

#### State the Objective

The study of Science offers incredible stories. Students will learn what their weight will be on the Moon. They will also see how galaxies are moving away from each other.

**Gain prior knowledge by asking students, “What do you know about \_\_\_\_\_?”**

Ask students, “Is the Moon larger or smaller than the Earth? If the Moon is smaller than the Earth, will it have as much gravity as Earth? (No) Will you weigh the same on the Moon as you do on the Earth?” (No)

### Content (the “Meat”)

#### Instruction / Demonstration (“I do” – “We do”)

1. Have students weigh themselves on the bathroom scales.
2. Record their weight.
3. Divide their weight by six because the pull of gravity on the Moon is about one-sixth of that on Earth. So if the student weighs 90 pounds on Earth, he or she will weigh 15 pounds on the Moon.
4. Ask students to discuss weighing only one-sixth of what they weigh now. What would they be able to do that they can’t do now? (Jump 6 times higher)
5. Have students find a partner and talk about this new experience. Draw a picture of their new life on the Moon.

#### **\*Activity → Teachable Moment(s) throughout**

Tip: Teachers, listen for questions that begin with “what” or “how.”

- **Student:** “How much does the Earth weigh?”
- **Leader:** “Actually, the Earth weighs 380,000 trillion tons! Awesome!”

#### **Students Practice (“You Do”) “Gazing at Stars”**

1. Divide students into small groups.
2. Talk about galaxies.
3. What is a galaxy? (A group of billions of stars and their planets, gas, and dust that extends many thousands of light-years and forms a unit within the universe. Galaxies are held together by gravitational forces. Most of the galaxies are shaped like spirals and ellipses.)
4. Blow up your balloon to half its capacity, but do not tie it.
5. With your marker, draw small specks all over the balloon.
6. Blow more air into the balloon.



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7. Look at the position of the specks.
8. Keep blowing and watch the specks. What do you notice? (Scientists think that the universe is growing in size just like the balloon did. This means that the galaxies are moving away from each other.)

### Closing

#### Review

**Sample Review:** "We learned how much we would weigh on the moon, and then found out about galaxies."

**Review:**

#### Debrief

##### WHI?

Ask the following three questions:

1. What were some of the questions that came up in your group?
2. How did you figure out that the galaxies are moving apart?
3. If you were to choose the best activity, which one would it be?

#### Reflection (Confirm, Tweak, Aha!)

**Sample Reflection:** "We learned that the universe is getting larger, not staying the same."

**Your Reflection:**