BALLOON BREAKDOWN

Are you curious?

You just might be an explorer! We're explorers too, and we love to make new discoveries.

Have you ever wondered what happens to a balloon after it pops? At first a broken balloon might not seem to be as interesting as one that's twisted into a funny shape, but then we wondered...

What happens to a balloon after it pops?

Rubber balloons are made from latex. Latex comes from trees. Wood and paper come from trees. ***Do balloons break down in the environment like wood and paper do?***

We want to find out what happens to balloons as they ***biodegrade***, or decay and become absorbed by the environment. We want to learn how long it takes for them to break down. And we're curious if there are ways to make them break down faster.

Justus

Leah

Will you help us with our experiment?

Have you ever heard of ***composting***? Compost is usually made by gathering plant material, like leaves, grass clippings, and vegetable peels, into a pile or bin and letting it decompose with the help of bacteria, fungi, and other organisms like earthworms.

While some experiments are quick, **this is a long-term project**. It will be quick to set up, and simple to keep track, but this experiment won't be finished overnight, or even in a few weeks. This is a big responsibility, but we heard you were just the right people for the job!

BALLOON BREAKDOWN

What do Scientists do?

They OBSERVE

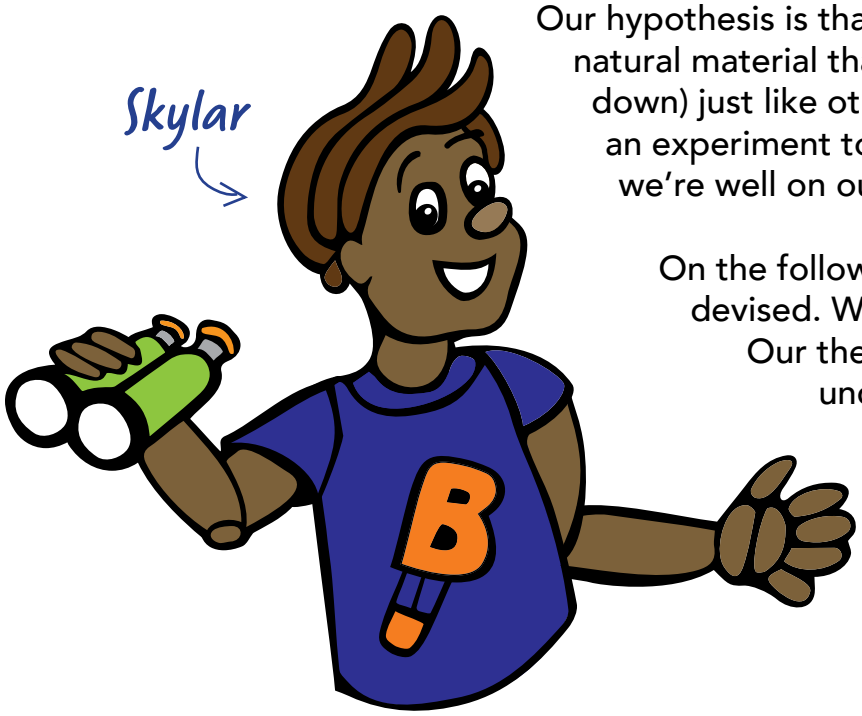
When you observe you're using your ***senses*** to learn about the world around you. What can you sense with your nose? ...eyes? ...ears? ...mouth? ...hands/skin?

They use their observations to come up with HYPOTHESES

If you opened the door to your house and you smelled delicious cheese, and maybe some tomato sauce and bread, what would you think you're having for dinner? A guess about your dinner is a hypothesis, until you test it.

They design EXPERIMENTS to test out their HYPOTHESES

To a scientist, a hypothesis, or belief, can only be called a theory after we conduct experiments to determine that our hypothesis is correct. If a carefully planned experiment gives the results we expect, we now have a theory that we can further test and refine.



Our hypothesis is that balloons, which are made from a natural material that comes from plants, decompose (break down) just like other natural materials. If we can devise an experiment to determine if our hypothesis is correct, we're well on our way to establishing a theory.

On the following pages, you'll see the experiment we devised. When we did the experiment, it worked. Our theory is that balloons always break down under the right conditions. Scientists don't accept theories as scientific fact until experiments repeatedly produce the same results. This is where you come in. We need more scientists like you to help us gather more data about how balloons break down.

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MISSION 1: Be in Control!

A ***control*** in an experiment helps scientist compare how small changes can affect something.
(If your group is doing more than one experiment, this one must be done at least once.)

Compost is made from a mixture of ***brown*** and ***green*** materials.
The starting material for your compost should be made of 5 equal parts. Three of those parts should be brown material, one part should be green, and one part popped balloons.

Brown Materials
(3/5 of the mix)
Brown, dry leaves
Dried grass
Cornstalks (shredded)
Straw

Green Materials
(1/5 of the mix)
fresh grass clippings
fruit and vegetable peels*
coffee grounds
weeds
green leaves

Balloons
(1/5 of the mix)

**Avoid any meat, dairy or oils in food scraps.*

SET UP YOUR "CONTROL" BIN:

1. With a permanent marker write "CONTROL" on the outside of the bin
2. On a data sheet ***document*** (write down/photograph) the compost materials you have selected.
3. Add the compost material to the bin.
4. Add a small amount of water to the bin. The bin should be damp like a sponge, but not soaking wet.
5. Gently shake the bin to settle the material. Draw a line on the inside of the bin at the top of the compost level.
6. Cover the bin.

BE A GOOD HOST:

Twice each week be sure to mix your compost and make sure the mixture stays damp. Whenever you check your bins, be sure to ***observe*** or look closely at the changes happening inside the bin. What do you see? Smell? Measure? Take pictures and record your results on the data sheets each time.

BALLOON BREAKDOWN

MISSION 2: What would you change?

A ***variable*** is something that can change.

Can you think of something that might make the balloons break down faster? Or maybe something that might slow them down? Don't just wonder, test it out! Be sure to only change ONE VARIABLE for each additional bin.

SET UP YOUR "VARIABLE" BINS:

1. With a permanent marker, number your experiment on the outside of the bin.
2. On a data sheet ***document*** (write down/photograph) the compost materials you have selected, as well as the variable that you have changed from your first experiment.
3. Add the compost materials to the bin.
4. Add a small amount of water to the bin. The bin should be damp like a sponge, but not soaking wet.
5. Gently shake the bin to settle the material. Draw a line on the inside of the bin at the top of the compost level.
6. Cover the bin.

BE A GOOD HOST:

Twice each week be sure to mix your compost and make sure the mixture stays damp. Whenever you check your bins, be sure to ***observe*** or look closely at the changes happening inside the bin. What do you see? Smell? Measure? Take pictures and record your results on the data sheets each time.

FOR INSTRUCTORS

BALLOON BREAKDOWN

These experiments are more than just a fun activity

This is a unique opportunity for kids to become citizen scientists. The data and images that the children collect are going to be used to teach others (even ADULTS, believe it or not!) how balloons decompose. We want the kids to understand the importance of consistency and thoroughness in their work. We believe that empowering them with the responsibility of these extended projects will inspire confidence and pride, and hopefully a life-long love of science and the scientific method!

What you'll find in this packet...

- Instructions for constructing a basic compost bin
- Getting Started Guide
- Sample data recording sheets (two different styles)
- Submission form

What you'll need/*what could be handy

- Compost bins (instructions included), or other method of composting
- Small pail/bucket for measuring equal parts of materials*
- small shovel or scoop*
- camera*
- 3 ring binder*
- compost thermometer*
- ruler*

What we're looking to collect...

- Completed data recording sheets
- Drawings and/or written descriptions of their process, or what they observe
- Photographic images of the balloon decomposition
- Photographic images of the kids at work doing their experiments
- 15 second video clips (up to 5)

MISSION 2 brainstorming ideas...

- Do certain colors of balloons break down faster?
- Does cutting up the balloons into smaller pieces first break them down faster?
- Does mixing in certain kinds of kitchen scraps break them down faster (ex. citrus peels)
- Does mixing the compost more often break down the balloons faster?

BALLOON BREAKDOWN

Send us an update

We'd love to see how your experiment progresses. If you are sharing images online, be sure to tag @Airigami on Twitter, Instagram and Facebook and/or use the hashtag #BalloonBreakdown. You can also write to us directly with anything you'd like to share about your experience conducting this experiment. We'd love to highlight photos, reports, drawings, and even hand-written observations from our citizen scientists on our blog. Information you wish to share can be sent to science@airigami.com. *Please contact us if you wish to send hard copies of your work.*

Submit your final results

Be sure to share your results online, but please also send copies of your data, photos, short videos, observations, and a completed submission form to science@airigami.com. We will share what we learn from all of you on AirigamiAdventure.com.

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BALLOON BREAKDOWN

How to Make a Simple Compost Bin

Composting doesn't have to be done in a bin, but for areas with limited greenspace, or pest control, they can be handy. When selecting bins look for rugged, dark bins that aren't too large. The children will need to be able to tip and shake them to help move the contents around. It is important to use identical bins for each experiment. (Different bins could be responsible for different results)

Supplies:

2 or more medium sized dark-colored tote bins with covers
Drill with 1/4" - 1/2" drill bit

Instructions:

Drill holes randomly on all sides of the tote bin, including the bottom and lid. These holes will provide ventilation and drainage.

Tote should be no more than half full of loose raw materials for best results. You will want at least 2 cubic feet of raw material to start with. Smaller materials will break down faster. You may want to chop up/break apart items into smaller pieces.

Bin should be placed in an uncovered area to allow for rainwater to pass into the bins. Ideally the mixture should be kept damp "like a sponge". You will need to water them to get them started. Ideally if you are doing multiple experiments, they should be started on the same day.

The bins should be checked and mixed at least twice each week. To mix, make sure the lid is securely on the bin and rock the bin from side to side. Then tilt it front to back. Two children with supervision should be able to do this easily. Note that dirty water ("leachate") may spill from the holes when tipped if there was recent heavy rain. Have the children hold the bin from the sides to tip the bin, so anything hopefully seeps out away from their feet!

BALLOON BREAKDOWN

Team/Group Name: _____ Bin # _____

Testing: _____

Starting Material Description:

_____

_____

_____

_____

_____

_____

_____

_____

_____

BALLOON BREAKDOWN

Team/Group Name: _____ Bin # _____

Testing: _____

	Date	Name(s)	I observed...	Took a Picture?	Mixed it up!
EXAMPLE	1/2/2016	Leah J.	Mix was damp, smelled like outside after the rain, lots of brightly colored large balloon pieces.	Yes	Yes

BALLOON BREAKDOWN

Team/Group Name: _____ Bin # _____

Testing: _____

	Date	Name(s)	I observed...	Took a Picture?	Mixed it up!
EXAMPLE	1/2/2016	Leah J.	Mix was damp, smelled like outside after the rain, lots of brightly colored large balloon pieces.	Yes	Yes

BALLOON BREAKDOWN

Results Submission Form

Congratulations! We're so excited to learn what you found out in your experiment!

Your name: _____ Adult contact (if minor): _____

Email: _____ Phone: _____

Mailing address: _____

_____

Team name: _____

Affiliated Organization/School (if any): _____

Description of team: _____

Team members/ages: _____

Name and contact info for local newspaper: _____

_____

When did you start your experiment? _____

When did you finish? _____

Brand of balloons (if you know): _____

Your source for broken latex balloons: _____

Is this your first time submitting? _____

Please provide a description of what you learned from your experiment. It's your choice as to the format and length of your response. A scan of this sheet, as well as your images, data and what you discovered can be emailed to: science@airigami.com.