



Science



Literacy

# PACKING PEANUTS

## Grade Level

3-6

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will have a better understanding of renewable, non-renewable, and biodegradable resources.

## Materials Needed

- [Cornstarch packing peanuts](#) (available from [uline.com](#))
- Styrofoam packing peanuts
- Clear 8-12 oz. cups (2 per group)
- Water (2 cups per group)
- Copies of student worksheet
- Copies of QR codes sheet (optional)

## Standards

### Common Core

CCSS.ELA-Literacy.W.3.1;  
W.3.7

### NGSS

K-2.ETS1-1; K-2-ETS1-2;  
2-PS1-1; 2-PS1-3

## Lesson Summary

This lesson is a hands-on activity that challenges students to strengthen inquiry skills as they use the scientific method to explore materials we use for every day objects. This also helps students critically think about renewable vs. non-renewable resources.

\*\*For younger grades, students will need to have already learned concepts such as hypothesis (and/or the scientific method), biodegradable, renewable, and non-renewable resources.

## Suggested Sequence of Events:

1. Set Up: Each group will need two clear cups, one half-way filled with corn packing peanuts, and the other half-way filled with Styrofoam packing peanuts. Have students label their cups "Packing Peanut A" and "Packing Peanut B." Each group will also need at least two cups with equal amounts of water in them.
2. Read through the IAITC Corn Ag Mag to learn about corn. Interactive online versions can be found on our website.
3. Read "[Corn](#)" by Gail Gibbons to snag student interest.
4. Complete the activity following the procedures:
  - Pass out the student worksheets and talk about the words "renewable" and "non-renewable." Have them brainstorm and list what resources are renewable/non-renewable. As they are working, pass out their lab materials.
  - As a class, have students share their lists and create one definition of each term to write on the board.
  - Have students work in small groups of two to three and follow the directions on their student sheets that will walk them through their scientific inquiry activity.
  - Once they are finished with their activity and have completed their worksheet, have students clean up their materials.
3. Whole class discussion and reflection of activity. Here are some discussion prompt ideas:
  - Did your understanding of renewable and non-renewable resources change or deepen after completing this activity? If so, how?
  - What do you think about using corn based products for something like packing peanuts? Is this better for the environment?

# TEACHER RESOURCES

## Additional Resources:

To help guide students through the experiment, we have added additional secondary sources that will help deepen and develop their understanding of the term “biodegradable,” facts about corn, and what makes Styrofoam. The articles from the websites can be printed, used as links in Google Classroom (for example) for students to use, or to be used as QR codes if your technology allows.

Observation: [Biodegradable](https://wiki.kidzsearch.com/wiki/Biodegradation) available at <https://wiki.kidzsearch.com/wiki/Biodegradation>.

Hypothesis: [Corn growth](https://youtu.be/iFCdAgeMGOA) available at <https://youtu.be/iFCdAgeMGOA>.

Experiment: [Corn based products](https://youtu.be/5J_ZD_vTRhU) available at [https://youtu.be/5J\\_ZD\\_vTRhU](https://youtu.be/5J_ZD_vTRhU).

Conclusion: [Styrofoam](https://easyscienceforkids.com/styrofoam-polymers/) available at <https://easyscienceforkids.com/styrofoam-polymers/>.

## Background Information:

Unlike Styrofoam packing peanuts, cornstarch packing peanuts are biodegradable and decompose in water, leaving no toxic waste. The polymers, long-chain molecules, that make up corn packing peanuts are polymers that occur naturally in nature as opposed to Styrofoam peanuts being made up of synthetic, or man-made, polymers. Corn, being a plant, is a renewable resource that we could use to reduce the amount of non-renewable and non-biodegradable products!

## Extension Ideas:

- Define and discuss the words “biodegradable,” “decompose,” and “toxic waste.” Dig deeper and look at the by-products and wastes from making various materials.
- Brainstorm as a class and make a T-Chart on the board and list renewable and non-renewable resources.
- For older students, have them research what products can be made renewable, but are still primarily made with non-renewable resources. (Ethanol, corn packing peanuts, plastics, etc.)
- Because the peanuts begin to break down in water, the peanuts can be used to construct sculptures and art. Simply “lick and stick.” Have student build structures out of the corn packing peanuts. A little spit goes a long way!
  - Have students think of the word “agriculture.” What is the first thing that comes to mind? Have them build that with their packing peanuts.
  - Give students the title of an upcoming reading assignment or book. What does each student think of when they hear that title? What will the book be about? Have each student construct their idea using the peanuts.
  - For younger students learning the alphabet or numbers, give them a piece of paper with a number or letter on it. Have them “trace” the number or letter with the corn packing peanuts by having them lick and stick them together.
- Learn more about other common corn-based products.
- Invite a corn farmer into the classroom to talk about types of corn, their uses, and what it takes to be a corn farmer.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!



# PACKING PEANUTS

## STUDENT WORKSHEET

Take a few minutes to think about resources that we use daily. Which of those are renewable? Which are non-renewable? Make your list of each type in the boxes below!

Renewable	Non-renewable

Now that you've shared your ideas as a class, write what it means for a resource to be renewable and non-renewable.

### OBSERVATION

Before any scientist begins the experimentation stage of their inquiry, they must make observations of the objects they are using in their experiment! This way, they can use that data to help determine how to complete their experiment and what materials to use. Observe your two types of packing peanuts and record your observations in the table below!

Sound	Color	Shape	Texture	Smell	Softness
Packing Peanut A	Packing Peanut B				



# PACKING PEANUTS

## STUDENT WORKSHEET

### HYPOTHESIS

We want to figure out which one of these packing peanuts is made from biodegradable materials. Based on your observations and your understanding of the term 'biodegradable,' write your hypothesis in the space below.

---

### EXPERIMENT

You should have two cups of water, with the same amount of water in each cup. Slowly pour one cup of water into the "Packing Peanuts A" cup and the other cup of water into the "Packing Peanuts B" cup. Record your observations in the table below.

Packing Peanut A	Packing Peanut B

### CONCLUSION

Now that you've finished your experiment, can you accept or reject your hypothesis? (Circle one)

Accept      Reject

What materials are the packing peanuts made from?

Packing Peanut A:

Packing Peanut B:

Which of these materials is renewable? Explain.



Science



Literacy

# PACKING PEANUTS

## STUDENT WORKSHEET

### OBSERVATION



### HYPOTHESIS



### EXPERIMENT



### CONCLUSION

