

# ScienceNews Learning

## EDUCATOR GUIDE



### *Science News Explores* October 2025

## A Squirrely Robot and Stinky Plants

## About this Guide

Incorporate articles from the October issue of *Science News Explores* to learn how scientists used biomimicry to engineer a new type of robot and answer questions about the biological and chemical processes happening in plants that have evolved to increase their stench.

### This Guide includes:

**Lesson Plan:** Here come the squirrel-bots

**Learning Overview:** Inspired by nature’s greatest acrobats, roboticists have made engineering leaps — creating and upgrading an agile, jumping robot that can grasp branches like a squirrel. Learn how scientists use biomimicry to launch new approaches to old engineering challenges. At the same time, explore concepts of momentum in daily life, then answer questions about possible applications for squirrely robots of the future.

**NGSS-DCI:** HS-ETS1, MS-ETS1.

#### Paired Articles:

*Science News:* “[A hopping robot shows off its squirrel-like skills](#)”

Readability Score: 8.7

*Science News Explores:* “[This squirrel-like robot has some serious hops](#)”

Readability Score: 6.0

**Student Worksheet:** These questions are formatted so it’s easy to choose the ones that will work for your students, post them to your LMS or print them off as a worksheet.

**Lesson Plan:** How plants level up their stink

**Learning Overview:** Some plants have evolved to produce putrid scents. Consider the phenomenon of smell before doing a card sort to show the biological and chemical processes happening in these plants. Then, answer questions about why and how the plants evolved to increase their stench.

**NGSS-DCI:** HS-LS1, MS-LS1.

#### Paired Articles:

*Science News:* “[Putrid plants can reek of hot rotting flesh with one evolutionary trick](#)”

Readability Score: 12.1

*Science News Explores:* “[A genetic trick leaves these stinky plants reeking of rotting flesh](#)”

Readability Score: 6.3

**Student Worksheet:** These questions are formatted so it’s easy to choose the ones that will work for your students, post them to your LMS or print them off as a worksheet.

## Lesson Plan: Here come the squirrel-bots

**Learning Overview:** Inspired by nature’s greatest acrobats, roboticists have made engineering leaps — creating and upgrading an agile, jumping robot that can grasp branches like a squirrel. Learn how scientists use biomimicry to launch new approaches to old engineering challenges. At the same time, explore concepts of momentum in daily life, then answer questions about possible applications for squirrely robots of the future.

**NGSS-DCI:** HS-ETS1, MS-ETS1.

### Paired Articles:

*Science News:* “[A hopping robot shows off its squirrel-like skills](#)”

Readability Score: 8.7

*Science News Explores:* “[This squirrel-like robot has some serious hops](#)”

Readability Score: 6.0

**Directions:** Have students watch this [video on acrobatic squirrels](#) before answering the “Before Reading” questions as a warmup in class or for homework. Now ask students to read the online *Science News Explores* article “[This squirrel-like robot has some serious hops](#).” Afterward, have them answer the “During Reading” questions. As an optional extension for deeper analysis on proportions and relative values, have students discuss the “After Reading” questions. This article also appears in the October print issue of *Science News Explores*. *Science News* offers another version of the same article written at a high school reading level. Post this set of questions without answers for your students using [this link](#).

### Before Reading

1. What does it mean for someone to “mimic” something or another person? Based on your understanding of this word, what do you think the term biomimicry might mean in an engineering context?

*To mimic means for one person to act like something or someone else. In engineering, biomimicry refers to the process of designing devices that mimic the structures, functions, or behaviors of living things.*

2. Watch this video on [acrobatic squirrels](#). What surprises you most about this video? List some abilities that squirrels appear to have from this video that are important for achieving these acrobatic feats.

*Answers will vary. Students may point to the squirrels’ balancing abilities or ability to learn and adapt to challenges.*

## **During Reading**

1. What does this article say is the secret behind a squirrel's acrobatic abilities?

*The secret to squirrels' acrobatic abilities is their exceptional balance.*

2. Give a specific example of how a squirrel might maneuver to correct a jump that is a bit too long or short.

*Squirrels can adjust how hard their legs land on a branch to gain balance.*

3. Momentum is the tendency for an object in motion to remain in motion. How does this relate to the hopscotch example described in the story?

*Landing too far forward might cause someone to fall forward and landing too far back might cause them to fall backward. Digging feet into the ground and leaning back or squatting would disrupt the forward or backward momentum and would help the person to regain their balance.*

4. What is an animal that you would describe as "saltatorial" — besides those mentioned in this story? Explain your answer.

*Students should describe a jumping animal, as the word "saltatorial" refers to something adapted for jumping. Possible answers include frogs, toads, rabbits, etc.*

5. How have researchers improved Salto's design since it was first developed in 2016?

*In 2020, they added a clawlike gripper to Salto's foot. This allows it to stand or crouch so it can land on flat surfaces.*

6. What are some improvements scientists still want to make to Salto's design?

*Scientists want to improve the clawlike gripper to make it easier for the robot to grasp its landing surface.*

7. Quantitative research collects data in the form of numerical measurements. Give one example of quantitative data collected by the researchers of this study.

*Researchers carried out quantitative research when they determined that Salto successfully leaped from one plastic pipe to another 25 out of 30 times.*

## After Reading

1. Do you think Salto's design is an example of biomimicry? Why or why not? Use at least one feature of Salto that supports your answer.

*Salto's design is an example of biomimicry because it emulates a squirrel's behavior and abilities. Answers may reference Salto's ability to crouch/stand, which mimics a squirrel's ability to crouch/stand straight to gain balance after a jump. Or answers may point to Salto's claw-like ability to grip, which mimics a squirrel's ability to grasp branches.*

2. Give one example of how Justin Yim imagines these robots might help people in the future. Come up with one other potential application for this technology. Give two changes or upgrades the robot would need for such applications.

*Justin Yim envisions that these robots could assist construction workers by transporting supplies across challenging-to-navigate construction zones. He also says they could help monitor the environment. These robots could also serve as urban monitors, such as to watch traffic. This application would require the robot to have a camera. Another possibility is that they could help repair power lines by climbing and leaping from one line to another. In this case, the robot would need to have a compartment to carry supplies.*

## Student Worksheet: Here come the squirrel-bots

**Directions:** Answer the “Before Reading” questions. Then read the online *Science News Explores* article [“This squirrel-like robot has some serious hops”](#) and answer the following questions as directed by your teacher.

### Before Reading

1. What does it mean for someone to “mimic” something or another person? Based on your understanding of this word, what do you think the term biomimicry might mean in an engineering context?
2. Watch this video on [acrobatic squirrels](#). What surprises you most about this video? List some abilities that squirrels appear to have from this video that are important for achieving these acrobatic feats.

### During Reading

1. What does this article say is the secret behind a squirrel’s acrobatic abilities?
2. Give a specific example of how a squirrel might maneuver to correct a jump that is a bit too long or short.
3. Momentum is the tendency for an object in motion to remain in motion. How does this relate to the hopscotch example described in the story?
4. What is an animal that you would describe as “saltatorial” — besides those mentioned in this story? Explain your answer.
5. How have researchers improved Salto’s design since it was first developed in 2016?

6. What are some improvements scientists still want to make to Salto's design?

7. Quantitative research collects data in the form of numerical measurements. Give one example of quantitative data collected by the researchers of this study.

**After Reading**

1. Do you think Salto's design is an example of biomimicry? Why or why not? Use at least one feature of Salto that supports your answer.

2. Give one example of how Justin Yim imagines these robots might help people in the future. Come up with one other potential application for this technology. Give two changes or upgrades the robot would need for such applications.

## Lesson Plan: How plants level up their stink

**Learning Overview:** Some plants have evolved to produce putrid scents. Consider the phenomenon of smell before doing a card sort to show the biological and chemical processes happening in these plants. Then, answer questions about why and how the plants evolved to increase their stench.

**NGSS-DCI:** HS-LS1, MS-LS1.

### Paired Articles:

*Science News:* "[Putrid plants can reek of hot rotting flesh with one evolutionary trick](#)"

Readability Score: 12.1

*Science News Explores:* "[A genetic trick leaves these stinky plants reeking of rotting flesh](#)"

Readability Score: 6.3

**Directions:** Prior to doing this activity with your class, create the cards to sort. Make one set of cards for yourself and enough additional cards for students to work together in pairs.

Each set should have 13 cards. Label index cards with items below. Some cards will also have chemical structures drawn on them.

- gene: *SBP1*
- gene: mutated *SBP1*
- *SBP1* enzyme — make two cards for each set
- different amino acids (draw general amino acid structure)
- methanethiol (draw chemical structure) — make three cards for each set
- dimethyl disulfide (draw chemical structure)
- gene duplication
- putrescene (draw chemical structure)
- dimethyl trisulfide (draw chemical structure)
- broken down methanethiol

Ask students to answer the first set of questions in small groups or as a full class discussion. Then have them read the *Science News Explores* article "[A genetic trick leaves these stinky plants reeking of rotting flesh](#)" and answer the remaining questions with a partner or in small groups. For background on the phenomenon of smell, check out the *Science News Explores* article "[Scientists Say: Olfactory](#)."

### The phenomenon of smell

1. Think about how you use your sense of smell. How does smell interact with other senses? How does smell influence your behavior?

*Students should list things that they can smell. They could say smell impacts taste or that smell affects their feelings. They would be more likely to eat or be drawn to something that smells good and avoid something that smells bad.*

2. How can you smell certain substances? What might make a smell stronger?

*Substances give off gaseous molecules. When those chemicals stick to molecules in our noses, we sense them. The more molecules that are sensed, the stronger the smell.*

3. Why do some substances smell and others do not? Brainstorm to identify some characteristics of odorous molecules that may differ from molecules that have no scent.

*Odorous molecules are volatile, or in a gaseous form. Typically, smaller molecules with a lower molecular mass may exist in a gaseous form at room temperature and pressure, whereas large molecules are more likely to be liquid or solid. Also, the human nose may only be able to detect molecules composed of certain groups or types of elements.*

### **A stinky plant**

Read the *Science News Explores* article "[A genetic trick leaves these stinky plants reeking of rotting flesh](#)" and answer the questions below.

1. According to the article, what purpose do plants use scent for?

*Plants use their scent to attract pollinators.*

2. Explain the step-by-step process of how the three groups of stinky plants studied by scientists in the article produce their putrid scent.

*The plants make an extra copy of the gene SBP1, which usually makes an enzyme that breaks down methanethiol. The extra copy of SBP1 is mutated, which causes it to make a different enzyme with a few differing amino acids. The mutated enzyme causes two molecules of methanethiol to link, creating dimethyl disulfide, which creates the putrid scent of rotten meat that the plant uses to attract flies.*

3. Put the cards provided by your teacher in order so that they match the order of the processes explained in the article. One process should show the creation of dimethyl disulfide, and the other should indicate the breakdown of methanethiol. Any cards that don't belong in the processes should be left out.

*Gene: mutated SBP1 points to SBP1 enzyme and overlaps with the different amino acids card. Two methanethiol cards should be put close to the SBP1 enzyme card that overlaps the different amino acids card and should point to the dimethyl disulfide card.*

*Gene: SBP1 points to SBP1 enzyme. One methanethiol card should be placed close to the SBP1 enzyme card and should point to the broken down methanethiol card.*

4. Are there any chemical similarities or differences that you notice among the sticky molecules?

*All the molecules contain sulfur, except for putrescence, and are composed of 11 or fewer atoms. Putrescence seems to be an outlier, as it contains nitrogen instead of sulfur.*

## **A genetic trick for evolution**

1. Why do you think plants have evolved to emit odors? Why would this adaptation have been so favorable for plants?

*Plants with odors were more successful in attracting pollinators, so they were able to reproduce more frequently than those that didn't produce odors. This adaptation would have been highly beneficial for plants, especially since they are not mobile.*

2. Explain what evolutionary process allowed plants to produce their stinky scent. How does this process encourage evolution?

*Gene duplication allowed plants to make an extra-stinky scent. Copies of original genes can mutate without causing harm to the original gene. Therefore, a species can experiment with duplications with low stakes for negative impact.*

## Student Worksheet: How plants level up their stink

**Directions:** Answer the first set of questions as directed by your teacher. Then read the *Science News Explores* article "[A genetic trick leaves these stinky plants reeking of rotting flesh](#)" and answer the remaining questions with a partner or in a small group.

### The phenomenon of smell

1. Think about how you use your sense of smell. How does smell interact with other senses? How does smell influence your behavior?
2. How can you smell certain substances? What might make a smell stronger?
3. Why do some substances smell and others do not? Brainstorm to identify some characteristics of odorous molecules that may differ from molecules that have no scent.

### A stinky plant

Read the *Science News Explores* article "[A genetic trick leaves these stinky plants reeking of rotting flesh](#)" and answer the questions below.

1. According to the article, what purpose do plants use scent for?
2. Explain the step-by-step process of how the three groups of stinky plants studied by scientists in the article produce their putrid scent.
3. Put the cards provided by your teacher in order so that they match the order of the processes explained in the article. One process should show the creation of dimethyl disulfide, and the other should indicate the breakdown of methanethiol. Any cards that don't belong in the processes should be left out.

4. Are there any chemical similarities or differences that you notice among the sticky molecules?

**A genetic trick for evolution**

1. Why do you think plants have evolved to emit odors? Why would this adaptation have been so favorable for plants?

2. Explain what evolutionary process allowed plants to produce their stinky scent. How does this process encourage evolution?