

LESSONS



SNAP CIRCUITS ELECTRIC BINGO

OVERALL TIME 60-minute lesson

GROUPS Three to four kids per kit

Next Generation Science Standards

Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. (Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound.)

(Energy 4PS3-4)

OBJECTIVE

- Identify and construct different types of circuits.
- Make connections to energy sources in real life.

OVERVIEW

Kids will engage in the basics of circuitry by building and drawing working electronic circuits.

MATERIALS

- Snap Circuit Kit & Resource Book
- STEM Circuit BINGO Board
- Pencils/Writing Utensils
- Batteries (AA)

KEY TERMS

Circuit: a complete and closed path around which electricity can flow.

Closed Circuit: an endless path for electricity to flow.

Conductor: an object or material that allows the flow of electrical current in one or more directions.

Insulator: an object or material that allows little or no electricity to go through.

Negative: the negative pole of a storage battery.

Open Circuit: an electrical circuit that is not complete.

Parallel Circuit: a circuit which has two or more paths for electricity to flow.

Polarity: attraction toward a particular object or in a specific direction.

Positive: the positive pole of a storage battery.

Series Circuit: an electrical circuit in which electricity passes through components following one path.

Short Circuit: the failure of electricity to flow properly.

LAUNCH 5 to 10 minutes

Have kids stand in a circle. Ask the following question and give kids a moment to think.

What items do you see every day that use energy from electrical current?

Go around the circle and have each child share an example, trying not to repeat one that was already said. This activity represents how much we rely on electricity throughout a given day.



EXPLORATION 40 to 50 minutes

Provide each team with a STEM bingo board (see page 26). Using Snap Circuits, the team will need to work together to build various types of circuits working towards a blackout bingo board (all boxes filled in). Each box of the bingo board has a different type of circuit or Snap Circuits component the team must build or incorporate in the build. Once they have built the circuit, the group must write down an example of where they might see this in real-life. For example, the flying saucer is an example of a ceiling fan, whereas a light switch is an example of a circuit with a switch. As kids are working, walk around to each of the groups.

Possible questions to ask:

- *What circuit are you building?*
- *What order are you connecting the parts?*
- *Can you trace the path the current flows through the circuit?*



CLOSING 5 to 10 minutes

Allow kids time to clean up and organize the Snap Circuits.

Bring the group back together. Ask kids to find a partner and answer the following questions:

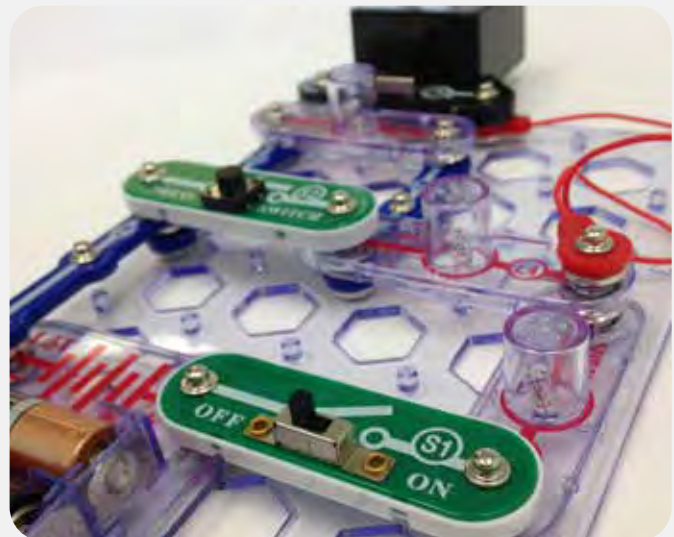
- *What new learnings did you have?*
- *What circuits were challenging to make?*
- *Why?*
- *Was your team able to make real life circuit connections?*

Choose a few partners to share aloud with the large group.

***Note:** *Have teams give each other a high five to celebrate their new learning.*

ENRICHMENT AND NEXT STEPS

Allow kids to explore the Snap Circuits guidebooks and build as many circuits as they want. Challenge them to design their own and explain how it works.



SNAP CIRCUITS BINGO

NAME _____

Using Snap Circuits, build an example of each of the circuits listed below. Then in the box, write down a short description, sketch of the activity, and where have you seen an example of this in real life?

| | | |
|-------------------------|---------------------------|-------------------------|
| COMPLETE CIRCUIT | FLYING SAUCER | MOTOR CIRCUIT |
| | | |
| FAN | FREE (YOUR CHOICE) | PARALLEL CIRCUIT |
| | | |
| SWITCH CIRCUIT | SERIES CIRCUIT | SOUND |
| | | |

GET SNAPPED WITH SNAP CIRCUITS 3

OVERALL TIME 60- to 120-minute lesson

GROUPS Three to four kids per kit

Next Generation Science Standards

4PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

(Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound.)

(4PS3 Energy)

OBJECTIVE

- **Identify and construct different types of circuits.**
- **Make connections to energy sources in real life.**

MATERIALS

- **Snap Circuit Kit (one per group)**
- **Snap Journal (one per person)**
- **Chart Paper**

PREPARATION

Copy Snap Journals for the class.

On chart paper, write the challenge and requirements.

LAUNCH 5 to 10 minutes

Have kids form a circle. Ask them to think about what their life would be like without electricity. Are there things they would miss? Go around in a circle and have each kid name one thing.

EXPLORATION 40 to 90 minutes

Have kids form groups of three to four. Once kids are in groups, explain that they will be exploring and interacting with basic circuitry using Snap Circuits to perform a challenge. Introduce the challenge, requirements, and Snap Journal.

CHALLENGE

Create a circuit that includes the following: light, movement, and sound.

Requirements:

- Groups will present their design.
- All kids will complete a Snap Journal.
- Each group member will be responsible for answering one or more of the following questions during the presentation:
 - *What is your Snap Circuit design?*
 - *Does your design include light, movement and sound?*
 - *Explain and demonstrate how the circuit works.*
 - *How did your team decide on this design?*
 - *Were there any challenges your team faced during this activity?*
 - *How did your team address these challenges?*

CLOSING 15 to 25 minutes

Allow each team 3 to 5 minutes to present.

GET SNAPPED WITH SNAP CIRCUITS 4

OVERALL TIME 60- to 120-minute lesson

GROUPS Three to four kids per kit

Next Generation Science Standards

4PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

(Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound.)

(4PS3 Energy)

OBJECTIVE

- Identify and construct different types of circuits.
- Make connections to energy sources in real life.

MATERIALS

- Snap Circuit Kit (one per group)
- Snap Journal (one per person)
- Chart Paper
- Vocabulary cards (one set for each group)
- Timer

KEY TERMS

Circuit: a complete and closed path around which electricity can flow.

Closed Circuit: an endless path for electricity to flow.

Conductor: an object or material that allows the flow of electrical current in one or more directions.

Insulator: an object or material that allows little or no electricity to go through.

Negative: the negative pole of a storage battery.

Open Circuit: an electric circuit that is not complete.

Parallel Circuit: a circuit which has two or more paths for electricity to flow.

Polarity: attraction toward a particular object or in a specific direction.

Positive: the positive pole of a storage battery

Series Circuit: an electrical circuit in which electricity passes through components following one path.

Short Circuit: the failure of electricity to flow properly.

PREPARATION

Copy Snap Journals for the class. On chart paper, write the challenge and requirements. Have a copy of the vocabulary cards cut out for each group.

LAUNCH 10 to 15 minutes

Have children form groups of 3 to 4. Explain to kids that they will be working together to complete an electricity vocabulary match. Pass out a set of cards to each group. Then, set a timer for five minutes. After kids have discussed and completed the match, ask if they have any questions about the vocabulary words.

EXPLORATION 45 to 90 minutes

Have kids form groups of three to four. Once kids are in groups, explain that they will be exploring and interacting with basic circuitry using Snap Circuits. Introduce the challenge, requirements, and Snap Journal.

CHALLENGE

As a team, think of an improvement to the classroom that could be made with electricity. For example, adding a doorbell to the classroom. Kids will make a model of their circuit using Snap Circuits. Teams will be allowed to use the Electronic Snap Circuits Instruction Manual. However, if the team uses the diagram from the manual to create the circuit, an additional change or modification must be made.

Requirements:

- Groups will present their design.
- All kids will complete a Snap Journal.
- Each group member will be responsible for answering one or more of the following questions during the presentation:
 - *What is your new Snap Circuit design that improved your classroom?*
 - *Explain and demonstrate how the circuit works.*
 - *How did your team decide on this design?*
 - *If you used the manual diagram, what modification did your team make?*
 - *Were there any challenges your team faced with this activity?*
 - *How did your team address these challenges?*

CLOSING 15 to 25 minutes

Allow each team 3 to 5 minutes to present.

ELECTRICAL VOCABULARY

| | | | |
|----------------------|--|-------------------------|--|
| Circuit | a complete and closed path around which electricity can flow | Closed Circuit | an endless path for electricity to flow |
| Short Circuit | the failure of electricity to flow properly | Series Circuit | an electrical circuit in which electricity passes through components following one path |
| Positive | the positive pole of a storage battery | Conductor | An object or material that allows the flow of electrical current in one or more directions |
| Insulator | an object or material that allows little or no electricity to go through | Negative | the negative pole of a storage battery |
| Open Circuit | an electric circuit that is not complete | Parallel Circuit | a circuit which has two or more paths for electricity to flow |
| Polarity | Attraction toward a particular object or in a specific direction | | |

GET SNAPPED WITH SNAP CIRCUITS 5

OVERALL TIME 60- to 120-minute lesson

GROUPS Three to four kids per kit

Next Generation Science Standards

4PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

(Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound.)

(4PS3 Energy)

OBJECTIVE

- **Identify and construct different types of circuits.**
- **Make connections to energy sources in real life.**

MATERIALS

- **Snap Circuit Kit (one per group)**
- **Snap Journal (one per person)**
- **Chart Paper**
- **Markers**
- **Masking Tape**

PREPARATION

Copy Snap Journals for the class. On chart paper, write the challenge and requirements.

LAUNCH 5 to 15 minutes

Have kids form groups of three to four. Provide each group with a piece of chart paper and markers. Explain to kids that they will have ten minutes to create a list of as many electricity words as possible. When the ten minutes are up, have kids display their posters on the wall.

Then, have groups participate in a Gallery Walk to view all posters.

Choose a few kids to respond to the following questions:

- *Did you notice any words that appeared on every list?*
- *Is there a word that stuck out for you during the Gallery Walk? What word? Why?*

EXPLORATION 45 to 90 minutes

Explain to kids that they will be exploring and interacting with basic circuitry to create a new circuit using Snap Circuits. Groups will remain the same for the challenge. Introduce the challenge, requirements, and Snap Journal.

CHALLENGE

Design your own Snap Circuit.

Requirements:

- Groups will present their design.
- All kids will complete a Snap Journal.
- Each group member will be responsible for answering one or more of the following questions during the presentation:
 - *What is your new Snap Circuit design that improved your classroom?*
 - *Explain and demonstrate how the circuit works.*
 - *How did your team decide on this design?*
 - *Were there any challenges your team faced with this activity?*
 - *How did your team address these challenges?*

CLOSING 15 to 30 minutes

Allow each team 3 to 5 minutes to present.