FIRST LEGO LEAGUE DISCOVER

TEAM MEETING GUIDE

SUPER POWERED℠

FIRST

LEGO education

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The **LEGO** Foundation

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Introduction to *FIRST*® LEGO® League Discover

In *FIRST*® LEGO® League Discover, children are introduced to the fundamentals of STEM while working together to solve fun challenges and building models using LEGO® DUPLO® bricks. Students gain habits of learning, confidence, and teamwork skills along the way.

FIRST LEGO League Discover is one of three divisions by age group of the *FIRST* LEGO League program and serves the youngest children. This program inspires young people to experiment and grow their confidence, critical thinking, and design skills through hands-on learning. *FIRST* LEGO League was created through an alliance between *FIRST*® and LEGO® Education.

FIRST® ENERGIZE℠ presented by Qualcomm and SUPERPOWERED℠

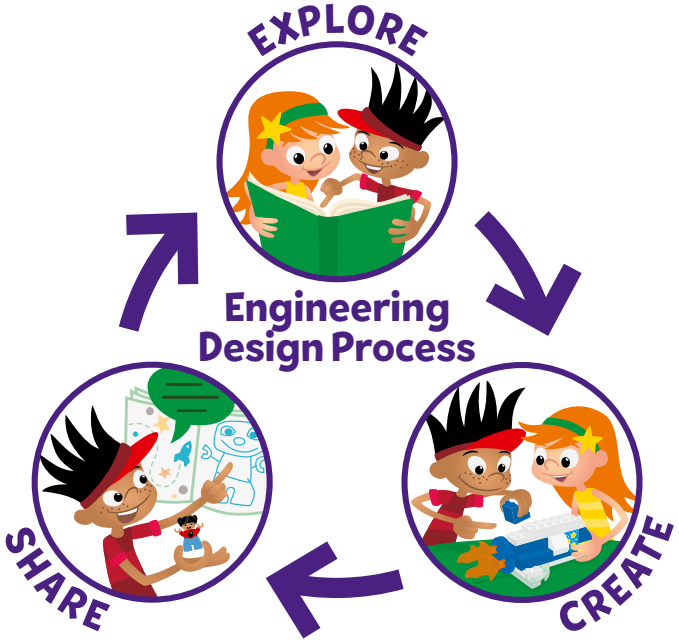
Welcome to the *FIRST*® ENERGIZE℠ season presented by Qualcomm. This year's *FIRST* LEGO League challenge is called SUPERPOWERED℠. Children will learn about how energy is generated, stored, distributed, and used.

Children work together in teams using DUPLO pieces from STEAM Park by LEGO Education and the Discover set. Children should be encouraged to work with their teammates, listen to each other, take turns, and share ideas and pieces.

Program Outcomes

The children will:

- Use and apply the *FIRST* Core Values, habits of learning, and engineering design process to create solutions.
- Explore the season theme and their ideas through collaboration, building, and playful learning.
- Create and test their ideas and solutions.
- Share and communicate what they have learned with each other and others.



Challenge Story

Let's discover where you get energy.

Now, explore how you use energy.

Then, create your community's energy story.

Finally, share what you have learned and celebrate with others.

Discover and Explore!

Welcome to SUPERPOWERED[SM]! The children will explore the entire energy journey, where energy comes from to how energy is used and all the steps in between. They will discover different energy sources and energy consumers. They will think about how energy is stored and distributed.

Build and Create!

The children will build a wind turbine and kitchen and use other pieces from the STEAM Park set to build their ideas. They will create their own energy story and build different ways energy is captured, stored, distributed, and consumed. They will test and improve their designs and creations.

Share!

The children will record their ideas and designs in their Engineering Notebooks. They will share their builds and what they learned with others. Finally, they will participate in the celebration event, to which you can invite their families and friends. Most importantly they will…

Playful Learning in Action

Research shows that when young children are engaged in playful STEM experiences, they ignite their natural curiosity, grow their knowledge, and develop habits of learning. When educators nurture these natural-born scientists, they build a bridge between the real world, STEM skills, and literacy.

Habits of Learning

In *FIRST*® LEGO® League Discover, children are given meaningful problems to solve. They work together to wonder and question, build and tinker, listen and share. By the end of their experience, children emerge more confident and better equipped to face future challenges.

It is important the children have fun. The more playful the sessions are, the more motivated and excited they will be. Don't worry if you don't know all the answers, and remember, there is no such thing as failure! If something goes wrong, you learn from it and try again.

Playful Learning in Action

FIRST® Core Values

The *FIRST*® Core Values are the cornerstones of the program. They are among the fundamental elements that distinguish *FIRST*® LEGO® League from other programs of its kind. By embracing the Core Values, children use discovery and exploration of the theme and learn that helping one another is the foundation of teamwork.

Teamwork
We are stronger when we work together.

Inclusion
We respect each other and embrace our differences.

Impact
We apply what we learn to improve our world.

Fun
We enjoy and celebrate what we do!

Discovery
We explore new skills and ideas.

Innovation
We use creativity and persistence to solve problems.

Early STEM Skills

Children will develop early STEM skills including:

- **Science**: cause and effect, gravity, force, motion, and simple machines
- **Technology**: tools and investigating how things work
- **Engineering**: creating designs, building solutions, and solving problems
- **Math**: abstract and quantitative reasoning, attributes of objects, and shape identification

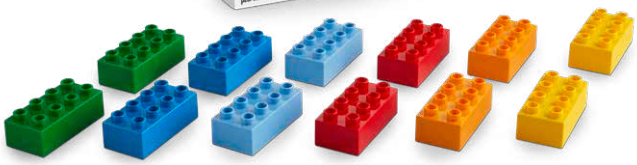
What Do You Need?

Engineering Notebooks *(per child)*

You will receive a set of *Engineering Notebooks*, which provide a place for children to record ideas and drawings. There is one page to fill in for every other session. Provide one notebook to each child.

Discover More Set *(per child)*

The Discover More set is designed for children to take home and keep even after their Discover experience is complete. The set includes two sets of Six Bricks for an adult and child to participate in the activities and play a game together. Further information can be found on the Family Engagement page.



LEGO® Education STEAM Park Set *(serves 8 children)*

All teams will use the STEAM Park set to explore STEM concepts and form the basis of their team model. This set will be used throughout sessions, as well as at the celebration.

There is also a *STEAM Park Teacher Guide* that contains lesson plans as well as other ideas and inspiration.

We suggest pre-teaching the following sessions from the teacher guide if the class or students are new to STEAM Park:

1. Functional Elements
2. Welcome to STEAM Park
3. Gears

Tip

STEAM Park comes in a cardboard box. You could store STEAM Park in a plastic storage tub, which might be better with frequent use.

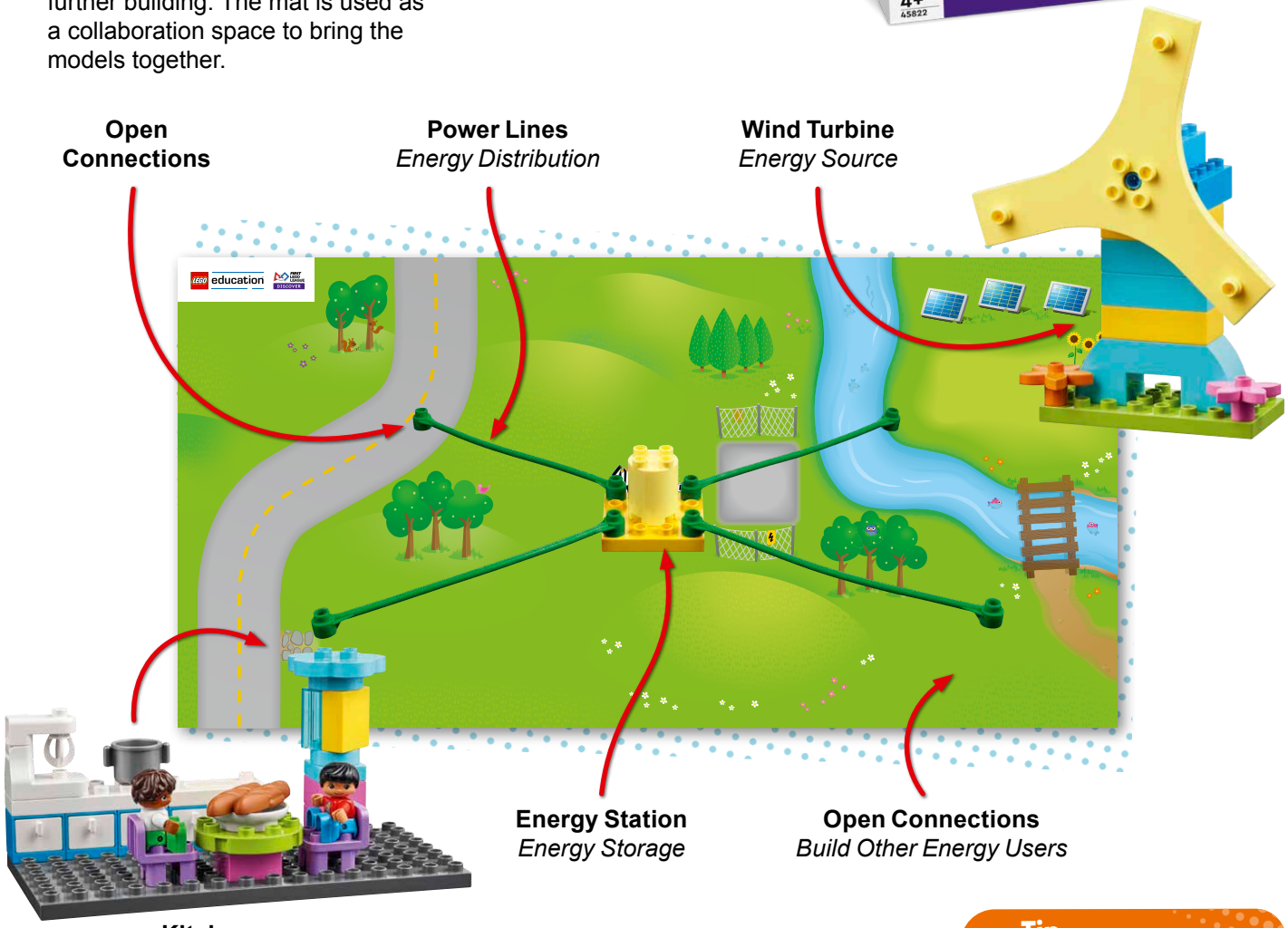
What Do You Need?

Discover Set Video

Discover Set *(serves 4 children)*

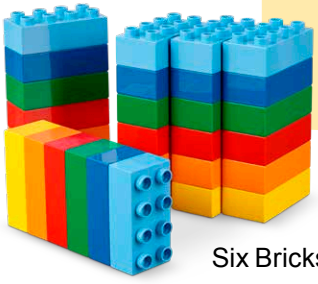
The Discover set consists of the Discover model, LEGO® DUPLO® figures, Six Bricks sets, mat, and building cards. The Discover model is intended to help children connect to the theme and provide a starting point for discussions and further building. The mat is used as a collaboration space to bring the models together.

Each Discover set includes five sets of Six Bricks for use in the classroom. There are enough sets to give one to each child, plus one for the teacher. Each child will need one of each of the six colored bricks.



DUPLO Figures

Building Cards



Six Bricks Sets

Tip

You could keep the children's Six Bricks in a separate, smaller container.

Family Engagement

Families who participate together in *FIRST*® LEGO® League discover the power of curiosity, creativity, and problem solving, building the foundation for lifelong confidence in STEM learning.

Family Engagement Resources

Each child should take home one Discover More set, which contains two sets of Six Bricks. You could send home the Discover More Game along with the Discover More set. The families will keep the Discover More sets, and they don't need to come back to the classroom.

Tip

If possible, hold a meeting with families to introduce *FIRST* LEGO League Discover and the Discover More game.

This meeting could cover:

- What *FIRST* LEGO League Discover is
- What the Habits of Learning are
- What the Core Values are
- The celebration event
- The Discover More set and game
- How to support children at home

If you're not able to hold a meeting, you might use a variety of other ways (letter, video, website, social media) to communicate this information to families.

The Discover More game provides families with all the instructions to play together. To get started, they will need the Discover More Game instructions, a Discover More set, a die, and a token for each player.

Recognizing that these activities have been done helps to build a bridge between home and school and the learning that takes place in both.

WHAT IS THE CELEBRATION EVENT?

At the end of the their experience, all teams should participate in a celebration event (Session 10). The children will love sharing with others what they have built and learned. It could be held in your usual session meeting space, a classroom, a library, or anywhere else that has appropriate room for the teams to spread out, build, and have fun.

BEFORE THE EVENT:

- Choose a good space.
- Invite families, caregivers, teachers, and friends.
- Find volunteer reviewers.
- Print reviewing questions (page 24) and certificates.
- Read through the celebration event session information.

DURING THE EVENT:

- Lay out the mats so two teams can work together.
- Assign at least one reviewer with each pair of teams.
- Get the kids excited for the final challenge.
- Ensure the reviewers talk with the children.
- Hand out certificates at the end.
- Have fun and celebrate children's achievements.

AFTER THE EVENT:

- Teach the other STEAM Park lessons.
- Continue to teach other STEM activities related to the theme.
- Find opportunities to use the vocabulary learned through the experience.
- Have the children use their teamwork skills in other sessions.

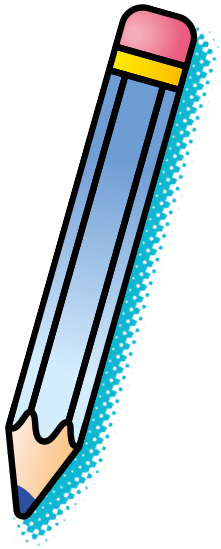
Tip

See pages 23-24 for more details on the event day.

Pre-Session Checkpoint

Read the student *Engineering Notebook* and this *Team Meeting Guide* before starting the sessions. They are full of very useful information to guide you through this experience. Use this checkpoint to help you get started and guide you toward success.

I'm Max! Come on. Let's go!



- [ ] Ensure you have received all materials needed to implement the program. See pages 8-9 for what you need.
- [ ] Identify the space where you will implement the program and store materials between the sessions.
- [ ] Think about the final celebration event. Will you have it in your classroom and invite the children's families? The celebration event is outlined on page 11 with details on pages 23-24.
- [ ] Create a plan for how you will use the program. How often during the week will you do it? Will you complete a whole session at once or split the tasks across different times?
- [ ] Determine how you will place the children into teams. The recommended team size is four children.
- [ ] Be sure the STEAM Park sets are unpacked and organized before starting Session 1.
- [ ] Get your children familiar with STEAM Park. Try the lessons noted on page 8.
- [ ] Encourage family engagement. Send the Discover More sets home with the children and a link to the Discover More game.

I'm Ruby! We are excited to join your children on their journey.

I'm Jacob! We will guide you through the SUPERPOWERED℠ Challenge.

Session Layout

	Warm-Up (Six Bricks) **10 minutes**	**Task 1** (Explore) **10 minutes**	**Task 2** (Create) **25 minutes**	**Task 3** (Share) **15 minutes**
Session 1 Let's Discover	Discover Six Bricks I	Energy Theme	Explore STEAM Park	Share Prompt
Session 2 Energy Sources	Discover Six Bricks II	Energy Sources	Wind Turbine and Energy Sources	Engineering Notebook Page
Session 3 Energy Connections	Energy Flow	Energy Connections	Energy Connections	Share Prompt
Session 4 Energy Users	Energy Device	Energy Users	Kitchen and Energy Users	Engineering Notebook Page
Session 5 Fun Fair	What Can You Build?	Mat Areas	Fun Fair with Moving Parts	Share Prompt
Session 6 Your Energy Story	Build the Picture	Energy Jobs	Your Energy Story	Engineering Notebook Page
Session 7 Electric Car	Energy Tower	Ramps	Electric Car and Charging Station	Share Prompt
Session 8 Future Energy	Future Car	Reflection	Energy Future	Engineering Notebook Page
Session 9 Improve Energy Story	Along the Wire	Energy Needs	Improve Your Energy Story	Share Prompt
Session 10 Let's Celebrate	**Final Celebration Event!**			

Session 1: Let's Discover

Each session provides a deeper connection to support you and your teaching.

As you go through these sessions, don't worry if you don't know all the answers – and remember, there is no such thing as failure! Also for the children, know that they will make mistakes and iterate on their designs.

What can we build with STEAM Park related to energy?

Each session has a Big Question that can be shared to frame the session.

Six Bricks Warm-Up (15 minutes)

Discover Six Bricks I *(see Appendix for full activity)*
The children will use the Six Bricks both in the classroom and at home with the Discover More set to learn new skills and explore new ideas 1

Task 1 (10 minutes)

Introduce the theme of energy. Have a discussion on these questions to start the session and explore the children's understanding. Recognize times in the school day when the children use energy.

To encourage language use, you could ask them:
- What is **energy**?
- What sort of energy do we use to make things work (i.e., sunlight, **electricity**, **fuel**)?
- How do you use energy (i.e., food, light bulbs, electronics)?

Task 2 (25 minutes) 2

Have the children build using the different pieces in STEAM Park. Encourage them to play freely and build anything they want, using their imaginations and discovering the pieces' **functions**. Help them identify pieces that could relate to energy.

Task 3 (15 minutes)

Have the children share and explain what they built and how the pieces they identified relate to energy. They could share in pairs or in their teams if they aren't comfortable sharing with entire class. All the children's builds will be correct and there is no one right answer to these sessions.

Outcomes

The children will play with STEAM Park, building creatively and trying new things.

The children will identify LEGO® elements that relate to energy.

Tips

1 Send home the Discover More game (see page 10) with the Discover More set with each child.

2 Check out the Functional Elements lesson for examples.

Key Vocabulary

electricity, energy, fuel, function

Playful Learning in Action

The children will use **discovery** to explore new ideas with STEAM Park. They will **wonder and question** what the pieces do.

Session 2: **Energy Sources**

Look at the three discussion points in Task 1 and see how they require different kinds of input from the children as they answer. Find ways to include different levels of questioning in all activities that lead children on their learning paths.

What are different energy sources in your community?

Six Bricks Warm-Up (10 minutes)

Discover Six Bricks II *(see Appendix for full activity)*

Task 1 (10 minutes)

Explain *FIRST*® LEGO® League Discover to the children. Tell them they will explore an energy journey. Read the Challenge Story to the children. 1

You could ask the children to:

- Name different places where energy is **captured** or **generated**.
- Describe characteristics of different energy **sources** (wind turbine, solar panels, oil, natural gas) and identify ones used in their community.
- Locate different energy sources found on the Discover mat.

Task 2 (25 minutes)

Have each team build the wind turbine from the Discover set, using the building card. They can place the wind turbine on top of the sandy area on the mat. Note: The wind turbine could remain assembled after this session to use in future sessions.

Then, they use the STEAM Park set to build additional energy sources that they have in their community. They are building solutions to solve the problem of getting energy to people. As with Session 1, encourage them to build freely, using their creativity and imagination to create new amazing designs. 2

Task 3 (15 minutes)

In their *Engineering Notebooks*, have the children write or draw a picture of energy sources in their community.

The children could include what their energy source is and a description (such as use, action, colors). The children could also share and describe what they built.

Outcomes

Teams will describe and build different energy sources.

The children will document different energy sources in their *Engineering Notebooks*.

Tips

1 The Challenge Story is found in the *Engineering Notebook* and on the mat.

2 Building cards in the Discover Set provide visual instructions to make the different parts of the Discover model.

Key Vocabulary

capture, generate, source

Playful Learning in Action

Teams will apply **teamwork** and **discovery** to explore the challenge.

Session 3: **Energy Connections**

Outcomes

Teams will explore how energy is stored and distributed.

Teams will build a toy that runs on a battery and a charging station for a cell phone.

This session introduces problem-solving tasks. Problem solving is a habit of learning the children should practice. Encourage the teams to persevere in the creation of their solutions. Then the teams can communicate and share their solutions with others.

How is energy stored and distributed in your community?

Six Bricks Warm-Up (10 minutes)

Energy Flow *(see Appendix for full activity)*

Task 1 (10 minutes)

Have each team unfold their mat and look at it. Talk about what things they can see. Point out different locations on the mat.

You could ask the teams:

- Give examples of how energy is stored (**battery**, fuel cell, energy storage).
- Give examples of different ways energy is **distributed** (power lines, fuel trucks, fuel tank, wires).
- Locate different ways energy is **stored** and distributed on the Discover mat.

Task 2 (25 minutes)

Have each team build the energy station and power lines from the Discover set and place them on the mat. These parts represent how energy is stored and distributed to different places. If their wind turbine is still built, they can connect it to one of the power lines.

Then, have the children use STEAM Park to build a toy powered by a battery. A battery is one way energy can be stored. They could also build a charging station for the cell phone included in the Discover set.

Task 3 (15 minutes)

Have the teams share their solutions to Task 2 on the mat. They could show the energy flow from the energy sources (solar panel, wind turbine) to the energy station. They could explain how the power lines are used to distribute energy.

Tips

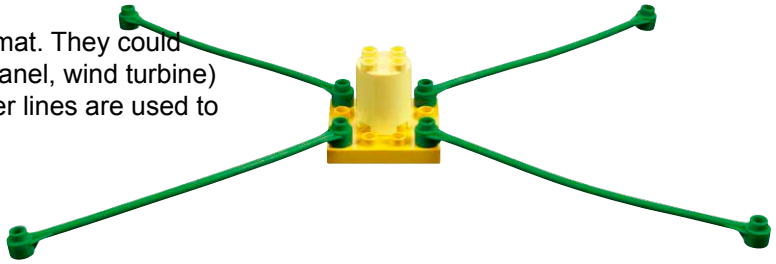
1. Children may be inspired to create their own designs different than what's on the building cards.
2. Encourage the teams to take turns acting out how energy travels from the source to the energy station.

Key Vocabulary

distribute, store, battery

Playful Learning in Action

Teams will use **teamwork** and **problem-solving** to build their solutions.



Session 4: **Energy Users**

Outcomes

Teams will identify different consumers of energy.

The children will document different energy users in their *Engineering Notebooks*.

Provide real-world examples, including photos and videos, when introducing the tasks. Set expectations for use of voice when sharing ideas. Expect productive talk, movement, and interactions between children. Circulate and redirect children to the task as needed.

How is energy used in your community?

Six Bricks Warm-Up (10 minutes)

Energy Device *(see Appendix for full activity)*

Task 1 (10 minutes)

Have each team unfold their mat. Look at the different places and things that use energy.

You could ask the teams:

- How do you **use** energy in your home? In your kitchen?
- How is energy used to cook food?
- What places on the mat **consume** energy?
- What devices and electronics use **electricity**?
- Where does electricity come from?

Task 2 (25 minutes) 1

Have each team build the kitchen from the Discover set, using the building card. They should place the kitchen on top of the apartment building on the mat. Ask them to explain how all the parts of the kitchen (pot, mixer, sink, lamp) use energy. They can focus on what energy is used to make the bread.

Then, they can use the STEAM Park set to build something else that uses energy in their community. They could pick an area on the mat to build something that uses energy. They can use one of the open connections on the end of the power lines to link their build to the energy supply. 2

Task 3 (15 minutes)

In their *Engineering Notebooks*, have the children write or draw a picture of different ways energy is used in their community. They could draw different places or different devices that consume energy.

Tips

1. There are many examples of energy being used within the kitchen and its parts.
2. Each child on the team could be given a different area on the mat to build an energy-consuming device.

Key Vocabulary

consume, electricity, use

Playful Learning in Action

The children will **listen and empathize** about each other's ideas. The team will listen to everyone's ideas, demonstrating **inclusion**.

Session 5: **Fun Fair**

Take what the teams have learned and challenge them one stage further. Take notice in this session how they can apply prior knowledge of the functional elements in STEAM Park. Check out the Functional Elements lesson for more guidance.

How can we use a moving part in our fun fair ride design?

Six Bricks Warm-Up (10 minutes)

What Can You Build? *(see Appendix for full activity)*

Task 1 (10 minutes)

Have each team unfold their Discover mat. Identify the different energy sources on the mat and how energy is transported to different areas. 1

You could ask the teams:

- What different types of **moving** rides have you seen or ridden at a fun fair, carnival, or amusement park?
- How could you create an **innovative** fun fair ride that uses energy to move?
- How can you connect your fun fair ride to the energy supply?

Task 2 (25 minutes) 2

Have each team pick out the **functional** pieces in STEAM Park and show how they move. There are some great pieces that are provided to make different fair rides.

They should use them to create a ride for the fun fair with moving parts. This will represent how the ride uses energy to make it move. The ride can be built on the mat on one of the open areas.

Task 3 (15 minutes)

Have the teams describe the movement in their builds. The teams could share together to give them more confidence in talking in front of people. They can demonstrate how their fun fair ride moves and explain how the ride uses energy. Ask them to use the word innovative where possible.

Outcomes

Teams will use imagination and creativity to create innovative moving ride designs.

Teams will apply knowledge of functional pieces to create a fun fair ride with moving parts.

Tips

1. The children could identify what areas they have in their community.
2. Each child on the team could design a different moving ride for their fun fair.

Key Vocabulary

functional, innovative, moving

Playful Learning in Action

Teams will **apply knowledge** from previous sessions and use **innovation** to creatively build their designs.

Example model that a child might build

Session 6: **Your Energy Story**

Outcomes

Teams will identify different energy jobs.

Teams will create an energy story of their community.

Provide real-world examples, including photos and videos, of people in energy jobs and their tools and vehicles. You could connect this to your social studies/global studies lessons on community helpers.

What is the energy story in your community?

Six Bricks Warm-Up (10 minutes)

Build the Picture *(see Appendix for full activity)*

Task 1 (10 minutes)

Have some children act out (mime) the different energy jobs and select others to guess what they are miming. Then repeat, swapping the children miming and guessing. 1

You could ask the children:

- What different **jobs** do people who work in energy have?
- Who works on power lines and energy stations in your **community**?
- What **tools** do these people use in their energy jobs?
- What types of unique vehicles do people use in energy?

Task 2 (25 minutes) 2

Have each team create the energy story for their own community. Be sure they include where their energy comes from and how it is used in different ways. They should include different energy connections including distribution and storage. They should also include different people who work with energy.

The teams could use pieces from the Discover set and STEAM Park and the various LEGO® DUPLO® figures to represent different energy workers, their tools, and equipment.

Task 3 (15 minutes)

In their *Engineering Notebooks*, have the children write or draw a picture of a person in an energy job. They can also draw a picture of their energy story and label each part (source, distribution, storage, user).

Tips

1. The children could act out the different jobs and what tools are used.
2. Giving examples of unique energy vehicles could help teams identify different jobs.

Key Vocabulary

community, job, tool

Core Values Connection

Using **teamwork**, the team will think about the **impact** of different energy jobs in their communities.

Session 7: **Electric Car**

Think about how the STEM content is explored in this lesson. See how specific science concepts are integrated into the problem-solving tasks. When the children ask a question, prompt them with a question back to guide their learning instead of giving them the answer.

How do electric cars use energy and travel on ramps?

Six Bricks Warm-Up (10 minutes)

Energy Tower *(see Appendix for full activity)*

Task 1 (10 minutes)

Show the children photos or videos of electric cars and vehicles using ramps.

You could ask the children:

- How do electric cars get charged?
- How does using an electric car help the environment?
- What is the purpose of **ramps**?
- Where would you find ramps in our community and what purpose do they serve?

Task 2 (25 minutes)

Build the inclined track (ramp) from the Ramps lesson. 1 You could have the teams test out the different wheelbases provided in the STEAM Park set.

Have the teams build different electric vehicle designs from the STEAM Park set. The teams can use the ramps to travel over the river. The teams should test the different electric vehicles going down the ramps to explore the effects of **gravity** and **speed**. 2

Task 3 (15 minutes)

Have the teams show their electric cars going down the ramps. Ask students what would the car need to go up the ramp. Encourage them to use the words *gravity* and *speed* when possible.

Outcomes

Teams will explore how electric vehicles use energy and design electric vehicles.

Teams will explore speed and gravity when testing their electric vehicles on the ramps.

Tips

1. You could have the ramps already assembled to allow children to focus on electric car designs.
2. Have the children play at charging the car before it has the energy to drive.

Key Vocabulary

gravity, ramp, speed

Playful Learning in Action

Teams will have **fun** building and testing their vehicles on the ramp. They will use **communication** to share their ideas and designs.

Session 8: **Future Energy**

This session is entirely devoted to iterating and improving ideas. Encourage children to focus on what they're creating instead of putting limits on what they build.

How can you create a better energy future by combining everyone's ideas?

Six Bricks Warm-Up (10 minutes)

Future Car *(see Appendix for full activity)*

Task 1 (10 minutes)

Have a discussion about these questions and the future of energy. The children could think about their community and what future energy needs they will have. Examples could include using more **renewable** energy or using energy more efficiently.

You could ask the children:

- How could you make future use of energy better?
- How have they worked together previously to **combine** ideas?
- What happens if we run out of **fossil fuels** in the future?

Task 2 (25 minutes)

Before building, have teams decide who will build each part of their future community. They will then build the whole future energy story including source, distribution, storage, and consumer.

Once everyone has built their part, encourage teams to look at each part that has been built and what it does. They should find creative ways to connect each part together. They can iterate on their designs to combine each other's builds.

Task 3 (15 minutes)

In their *Engineering Notebooks*, have the children write or draw their future community. Ask them to explain how they combined their ideas to create the ultimate solution.

Outcomes

The teams will apply knowledge and experience from the previous sessions to solve a problem.

The teams will work together to combine ideas to create a cohesive solution.

Tips

1. Teams are improving their ideas, not necessarily their actual models from past sessions.
2. You could assign each child part of the energy journey for which they can create a future design.

Key Vocabulary

combine, fossil fuels, renewable

Playful Learning in Action

Teams create solutions while considering the **impact** on their town. By improving their designs, children will show **confidence** in their ability to build and iterate.

Session 9: **Improve Energy Story**

It is time to reinforce the use of teamwork skills such as sharing, discussing, and compromising. Observe how the teams talk to each other and evaluate how this has changed over the course of the program.

Outcomes

Teams will reflect on their experiences throughout the sessions.

Teams will build their improved solution to their community's energy story.

How do we improve the energy story of our community?

Six Bricks Warm-Up (10 minutes)

Along the Wire *(see Appendix for full activity)*

Task 1 (10 minutes)

Ask the children to reflect on their experiences throughout the sessions. Leave time for them to tell their improved energy story and to make sure everyone says something.

You could ask the children to:

- How can they **improve** the energy story of their community?
- **Reflect** on their solutions from previous sessions. How could they **iterate** and improve on their previous ideas?
- How could they make better energy choices?

Task 2 (25 minutes)

Tell the teams they will build on and improve their ideas and solutions from previous sessions. The teams can use pieces from the Discover set and STEAM Park. They could think about the different people in their town and what energy needs they have. Have them discuss who will say what about their solution in Task 3.

Task 3 (15 minutes)

Have the children share what they have built with the whole class. Have them explain how they improved their community's energy story. Have teams reflect on which ideas they chose, why, and how they worked together in this session.

Tips

1. Encourage children to think about and choose the best idea they had in the previous sessions.
2. It is important for teams to work together to combine their ideas into a cohesive solution.

Key Vocabulary

improve, iterate, reflect

Playful Learning in Action

The teams will **persist** to create a team build and use **teamwork** to join their builds together.

Session 10: **Let's Celebrate**

Preparing the Teams (10 minutes)

Welcome the children to the event and tell them what they will do during the session. They will use their ideas to build their team model together, share their *Engineering Notebooks*, and solve a special challenge. The children can complete the Session 10 *Engineering Notebook* page to provide direction on what to share with the reviewers.

Final Challenge (20 minutes)

At the event, have the teams:

- Build their team model of the entire energy story of their community and including all parts from the Discover set.
- Use STEAM Park pieces to make something move to represent energy being used.

Special Challenge (10 minutes)

Match up two teams and have them solve the special challenge together:

You could ask the children to:

- Distribute energy between the two team models using functional pieces from STEAM Park.
- Connect the two team models to the same energy supply.
- Create connections from different energy sources between the two team models.

Reviewing the Teams (during the event)

The reviewers should visit the teams during the challenge, talking with them, asking questions and seeing their Engineering Notebooks. Encourage the adults to interact with the children. They should ask about what the teams have done throughout the program.

Celebrate (10+ minutes)

While the building, problem-solving, and reviewing are the most important part of how the event works, you should allow plenty of time to celebrate each team's achievements in front of everyone at the event. You could extend this time and allow time for the children to share and present what they learned.

Tips

1. It is important teams can relate what they do at the event to the sessions they have completed.
2. If possible, assign at least one adult to each pair of teams. They can help the teams stay on task and talk with them. The reviewers will decide on awards for each team. Reviewing questions are on page 24.
3. For the celebration, print certificates for every child. Have the children come up one at a time, or in their team, to be recognized and applauded. A great *FIRST*® LEGO® League Discover event always ends in a celebration.

Reviewing Questions

These questions are designed for adults to start conversations with the children at the celebration event.

Reviewers could ask the teams:

Final Challenge

Tell me about…

- Your design and build.
- Why you built it that way.
- What you included in your energy journey.
- Your energy story.
- How you decided what you wanted to build.
- How it works.
- The STEAM Park pieces you used to make something move.

Special Challenge

Tell me about…

- How you solved the special challenge.
- How you decided how to connect your team models together.
- What you built to connect the two team models.

Working as a Team

Tell me about…

- How you worked together.
- The job do you had on your team.
- How you shared ideas in your team.
- How you worked as a team.

Awards

Every team should win an award, and more than one team can win the same award.

Choose from this list of official Discover awards:

- Cooperative Builders
- Super Problem-Solvers
- Expert Explainers
- Creative Designers
- Amazing Inventors

Certificates:

Six Bricks Activities

In addition to the Six Bricks activities listed in this *Team Meeting Guide*, you can find more activities on legofoundation.com. Some of these Six Bricks activities are modified versions of activities provided in the QR code.

Discover Six Bricks I

Children learn to:

- Play and become familiar with the bricks.
- Listen and respond to questions.
- Use descriptive language.

Base Activity

1. Each child separates his or her bricks and spreads them out.
2. With closed eyes, they shuffle their bricks around.
3. Keeping their eyes closed, each child picks any brick and holds it up high.
4. Now they open their eyes and see what color they hold.

Part 2

5. Let them pick any brick, look at it carefully, and turn it around and over in their hands.

Guiding Questions:

- *What color brick do you have?*
- *Can you name all the different colors?*
- *Can you sort the bricks into warm and cold colors?*
- *Can you create a rainbow with your bricks?*
- *What color is your brick? How does it feel* (rough, smooth, hard, soft, shiny, dull, etc.)*?*
- *What spaces and shapes can you see on your brick? How many studs does each brick have?*

Discover Six Bricks II

Children learn to:

- Use spatial skills to orient themselves.
- Keep attention and resist distraction.
- Initiate activities.

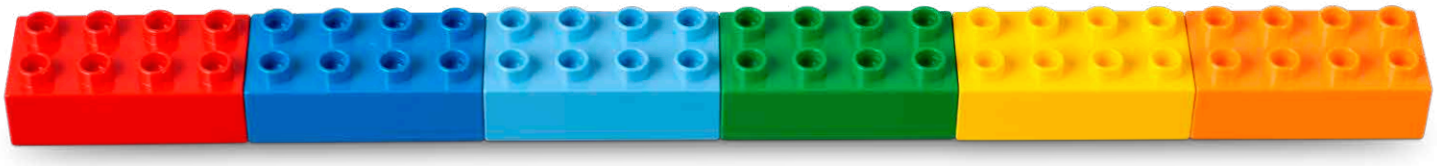
Base Activity

1. Children lay out their bricks in any order (see the picture).
2. Then they put a finger on the red brick and move it left.
3. They turn the dark blue brick upside down (or on its side).
4. Children click the green brick on the red and cover all studs.

Vary the instructions you give such as colors, moving bricks left/right, and positions.

Guiding Questions:

- *How did you keep attention* (encourage some of the children to explain in turn)*?*
- *How can we make this activity harder?* (Give more instructions, say them faster…?)



Six Bricks Activities

Energy Flow

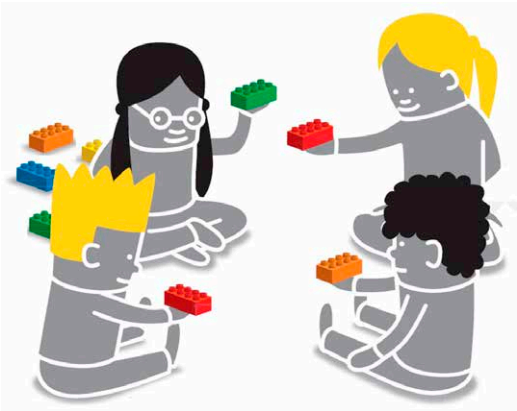
Children learn to:
- Move fingers and hands with precision.
- Persist in the face of difficulty.
- Develop own ways of carrying out tasks.

Base Activity

1. Have the children get into groups of 4 sitting in a circle.
2. Assign each child one of these roles: generator, distributors (2), and user.
3. The children will use these roles to show how energy flows from start to finish.
4. Place all the bricks with the generator. Have the generator pick up one brick. This represents the energy source.
5. The distributor will take the brick from the generator and hold onto it. This represents storage and distribution.
6. Have the other distributor take the brick and pass it to the user. This represents energy distribution and consumption.
7. The user will keep the brick because the energy has been used.
8. Repeat this process until there are no longer any bricks with the generator and all the bricks are with the user.

Guiding Questions:

- *What type of energy source does your brick represent?*
- *Why didn't energy flow back to the generator after it was used by the user?*



Energy Device

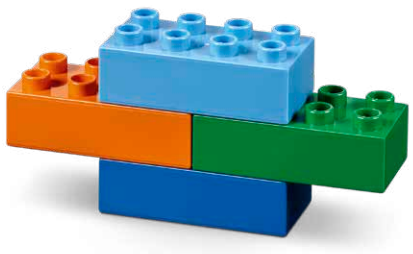
Children learn to:
- Hold information in their memory.
- Keep attention and resist distraction.
- Speak about how they have done something.

Base Activity

1. Have the children use their six bricks to build a device that uses energy in their home.
2. Then have them act out how they use that device and how it is powered.
3. Have them share their designs with each other.
4. Then have them explain what other devices use energy in their home.

Guiding Questions:

- *What is the name of your device?*
- *Does your device use electricity or a battery to power it?*
- *How does energy get to your home?*



What Can You Build?

Children learn to:
- Invent and describe characters (for stories).
- Create stories in groups.
- Ask questions and suggest answers.

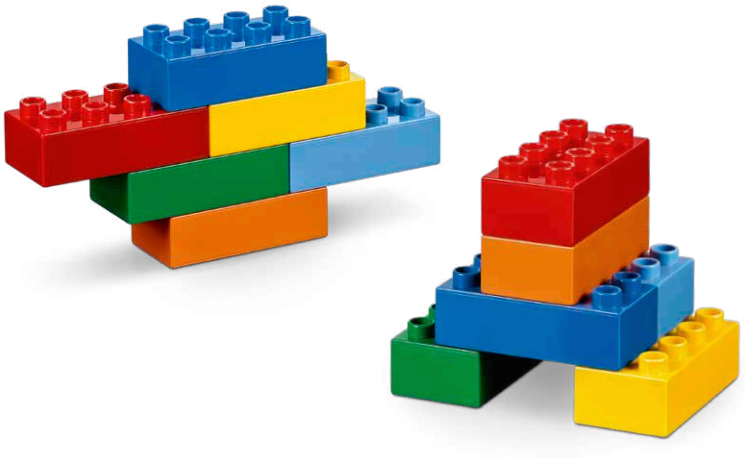
Base Activity

1. In groups of 4, children mix their bricks together.
2. Have the children use their bricks build a model that represents an energy source (like a solar panel) or energy consumer (like a fun fair or amusement park ride).
3. Then have them describe how the ride uses energy to make it move.
4. Then have them create characters that are riding the ride..

This activity can also be linked to a theme, story, or book.

Guiding Questions:

- *Does your ride have a name?*
- *What sound does it make?*
- *How does it move?*
- *How does energy get from the source to the ride?*



Build the Picture

Children learn to:
- Engage in creative problem-solving.
- Develop own ways of carrying tasks.
- Use strategies learned earlier (representing).

Base Activity

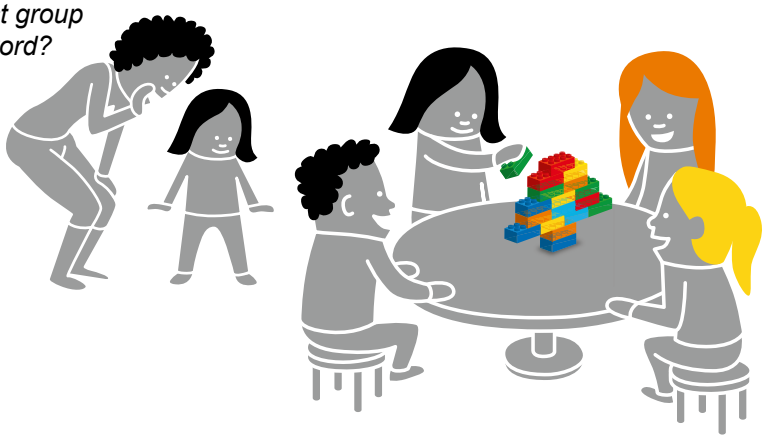
1. In groups of 4, children mix their bricks together and choose a leader.
2. The adult whispers a word related to energy (e.g., light, electricity, solar panel, wind turbine) to the leader.
3. Back with his or her group, the leader quickly builds that word for the others to guess.
4. The group may not ask questions but can call out words. The leader can say when they get it right.

Part 2

5. Choose a new leader and repeat the activity with a new word.
6. Continue until all children in the group have been a leader.

Guiding Questions:

- *How did the first group figure out the word?*
- *What can you do to help the next leader of the group?*



Six Bricks Activities

Energy Tower

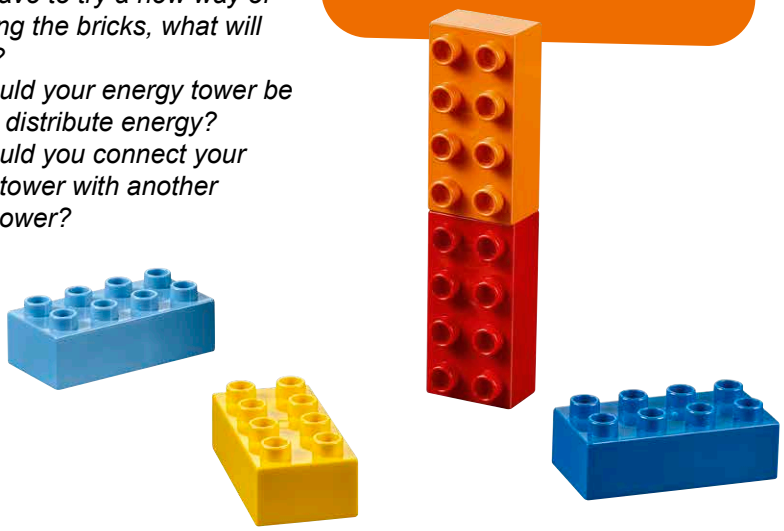
Children learn to:
- Move fingers and hands with precision.
- Persist in the face of difficulty.
- Develop own ways of carrying out tasks.

Base Activity

1. Children separate their bricks and lay them out in any order.
2. Then they balance all their six bricks, short end to short end, building an energy tower.
3. Children try changing the hand they use when building.
4. Finish the activity by letting them restack their six bricks.

Guiding Questions:

- *How did you balance your bricks? (In turn, let some of the children explain what they did.)*
- *If you have to try a new way of balancing the bricks, what will you do?*
- *How could your energy tower be used to distribute energy?*
- *How could you connect your energy tower with another child's tower?*



Future Car

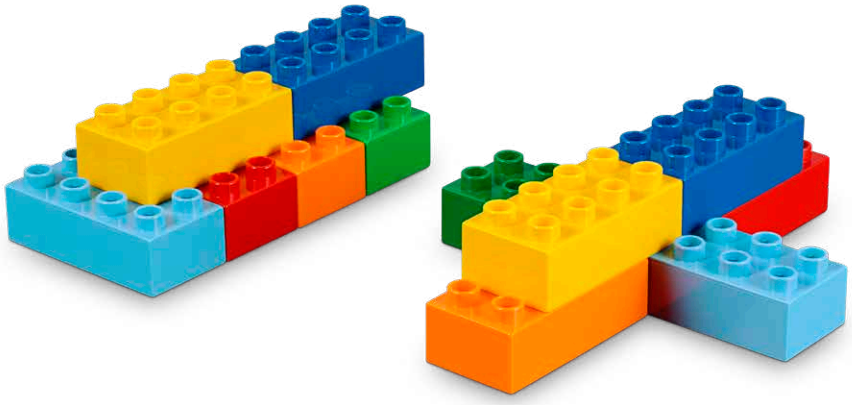
Children learn to:
- Engage in creative problem-solving.
- Imagine and tell stories.
- Use strategies learned earlier (representing).

Base Activity

1. Children use their six bricks to build a vehicle of the future that uses energy in a better way.
2. Then they take turns describing how their vehicle. They can explain what kind of energy it uses and where you get energy.
3. Then have them explain why the energy they chose is better.

Guiding Questions:

- *What type of energy does your vehicle use?*
- *How does your vehicle move?*
- *Where will energy come from in the future?*
- *Do you have any questions to ask your friends about their model?*



Along the Wire

Children learn to:

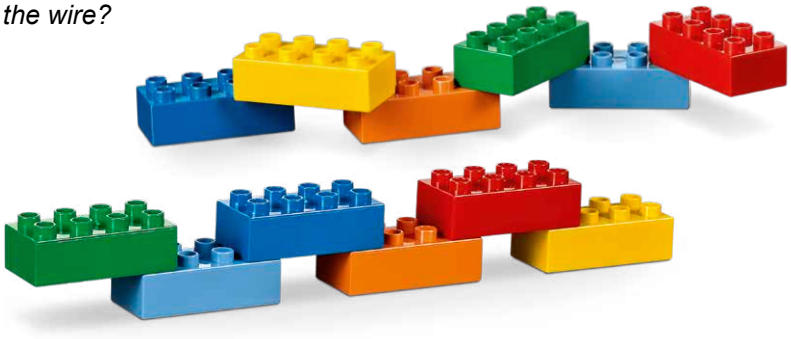
- Use strategies learned earlier (patterns).
- Negotiate when and how to carry out a task.
- Imagine and tell stories.

Base Activity

1. In groups of four, have the children mix their bricks together.
2. The children should work together to build a long line of connected blocks to represent a wire that transmits energy.
3. The children should think about where the energy starts and how it will travel to the end of the line.
4. Allow the group to think about how to explain their design and how energy travels along the wire.

Guiding Questions:

- *How can you show movement of energy in your wire?*
- *How can you present how energy flows along the wire to others?*
- *What provides the energy at the start of your wire (source)?*
- *What will use the energy at the end of the wire (energy user)?*
- *What would happen if there was a break in the wire?*



Supporting Activities

- Using a camera, smartphone, or tablet, children could take photographs of their creations, which can then be displayed in future sessions.
- Give children a collection of relevant words, each word fixed to a separate LEGO® DUPLO® brick. Children can then create their own poems about energy by locking the bricks together in a poetry tower.
- Ask half of the children to take on the role of a reporter and the other half to take on the role of an energy designer. Have the reporters interview the designers about a new ways to produce or use energy, energy jobs, or energy tools and equipment as they are designing and creating.
- Ask the children to create short animated films of their models. This could be done using a tablet and an animation app.
- Ask children to create a simple pop-up book about their own energy story in their community – there are websites that give advice about creating such books.

During each session, we recommend that children be encouraged to rebuild their models and play with them after they're built. Ask children to create a short role-play scene with their models or figures.

If you have additional time in a session or want to challenge the children further, you could use these supporting activities.

Notes

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