Big Idea
Using our imaginations to problem solve and transforming something old into something new.

Your students will:
• Use discarded materials in a design challenge
• Collaborate in pairs
• Brainstorm a design and build a prototype

Build a Playground with Freddie
As a class, co-view the clip from the episode “Creative Reuse and the Birdhouse 3000,” in which Freddie learns that sometimes creating something new from something old is better than getting the newest, fanciest thing. She learns to think like a designer and discovers that we can create less waste by finding new uses for things that we already have. Prompt a discussion about the episode. Conversation starters might include:

1. At first, Freddie really wants a brand new and expensive birdhouse. What does she learn from Megan that helps change her mind?

2. What are some of the decisions Freddie and Megan make in creating their gnome playground? What questions did they ask and what choices did they make?

3. What do you think it means to be a problem solver? What might be the most challenging part of trying to solve a problem?

Materials
• Paper
• Pencil
• Ruler
• Masking tape
• Scissors
• Any small figurines to “play” in your playground
• Any recycled materials from school or home (cardboard, toilet paper and paper towel rolls, scrap paper, tin foil, bubble wrap, egg cartons or popsicle sticks)
Make a Mini Playground

Teacher Prep:
1. Invite students to bring in recycled materials over the course of a few days or weeks prior to conducting the lesson. Start collecting discarded materials from around the classroom as well.
2. Consider dedicating a corner of your classroom to be the “trash into treasure” corner to build the students’ excitement for the project and help them get inspired as the materials pile up.
3. Consider demonstrating a few different ways to use recycled materials to create pretend playground equipment when introducing the project. A cut toilet paper roll on an angle makes for a great slide, while arched strips of paper are perfect for tunnels.

Instructions
1. Divide students into pairs and have them select a figurine for whom to build their playground. It could be a LEGO figure, a game piece or a small creature they make themselves.
2. Have each pair brainstorm a playground design for their figure. What does your figure need to be able to play? What kind of fun do they want to have? Look through the recycled materials to spark ideas and inspiration.
3. Have them collect their materials and sketch their ideas on a piece of paper. Offer rulers and encourage them to measure their figurine and their supplies to make sure everything fits.
4. Start building! Find inspiration in Megan and Freddie’s creation. Students can use their playground blueprints to execute their design. Encourage them to make changes as they go, and to use lots of trial and error. If their design doesn’t work the way they want it to, that’s okay! It’s all part of the process. Build that part again. Designers call this “iteration.”
5. Once the students are done, invite each pair to demonstrate how their playgrounds work. Encourage students to ask questions of each design team about their structure.

Vocabulary
- **Prototype:** A first pass or model of something
- **Design:** The way something is put together or constructed to achieve a certain goal
- **Blueprint:** The plans, measurements and drawings that are made before something is built
- **Recycle:** To reuse something that’s no longer needed by turning it into something else
- **Iteration:** Improving on a design by testing it, changing it and trying something new
Tips and Extensions

- Make a birdhouse 3000! Freddie learns that she can make a birdhouse using a shoebox, popsicle sticks and glue. What can you use to make a birdhouse?
- There are many other STEM activities that you can try with recycled materials. Here are some more ideas:
  - Create your own boat. How can you build a structure that floats?
  - Engineer a bridge. Can you place an object on top without the bridge collapsing?
  - Hold an egg drop. Can you build a structure that protects an egg from cracking when dropped from above?

School-to-Home Connection

- Encourage students to recycle at home and to donate used items that they've grown out of or don't use anymore. You might even consider holding a used toy or clothing drive.
- Engage families in collecting recycled materials for your mini playgrounds.
More about Studio Ludo
Studio Ludo is a design firm dedicated to play, research, design and advocacy. Studio Ludo designs playgrounds and playspaces for children and their communities where they feel welcomed, engaged and inspired to play. The company also founded the Playbrary, a loose parts library full of recycled supplies that is now housed at Smith Playground. Learn more at studioludo.org, or find one of their playgrounds to try out yourself!

More about Smith Playground
Smith Memorial Playground is a free 16,000-acre playground and playspace located in Philadelphia's Fairmount Park. The playground is known for its iconic “Giant Wooden Slide.” Both the playground and its historic playhouse are free and open to the public. Learn more at smithplayground.org.

More Classroom Activities
Visit PBS LearningMedia for more lesson plans like this inspired by The Infinite Art Hunt.

Children’s Books with Related Themes
Check out these children's books online or at your local library to continue exploring the concepts in this episode.

Be a Maker by Katey Howes
A young girl creates, makes and designs all kinds of things, and ultimately builds a playground with her community.

Rosie Revere Engineer by Andrea Beaty
Rosie transforms odds, ends and trash into treasure and embraces failure as she envisions and builds new inventions.