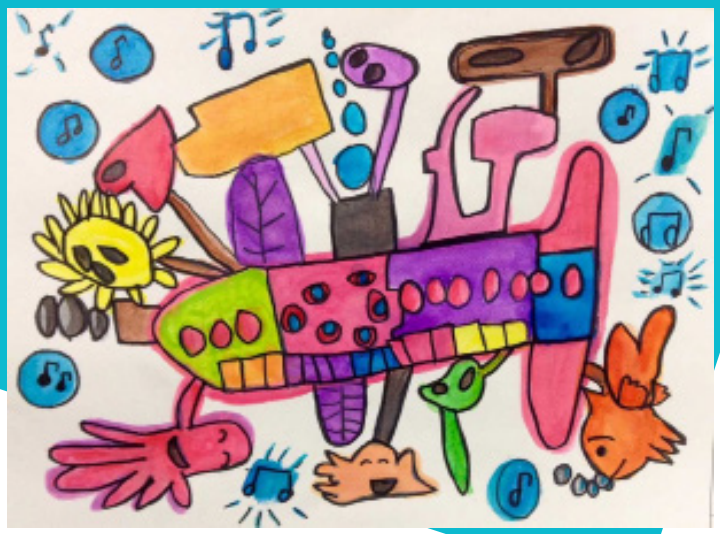
Innovate–Make It Great!

Design Thinking



Introduction

Have you wondered how inventors and innovators come up with new ideas and unique designs for everyday things? Have you ever looked at a household item and thought of ways to make it better? Kids have great ideas! Let's tap into the brilliance of children and help them think like innovators!

LEARNING OBJECTIVES

Children will:

- examine household items and situations to identify a problem;
- define possible solutions;
- explore ways to innovate as they sketch new designs; and
- assess how well their ideas solved the problem.

Vocabulary

invention	problem finding	sketch
innovation	problem solving	design

Essential Questions

- How do inventors and innovators identify a problem?
- What kinds of questions help them find ideas that could solve the problem?
- What does having a flexible mindset mean? Why is it important to keep our minds open to others' ideas and try new ways of doing things?
- How do inventors and innovators know that an idea is worth exploring?

Supplies

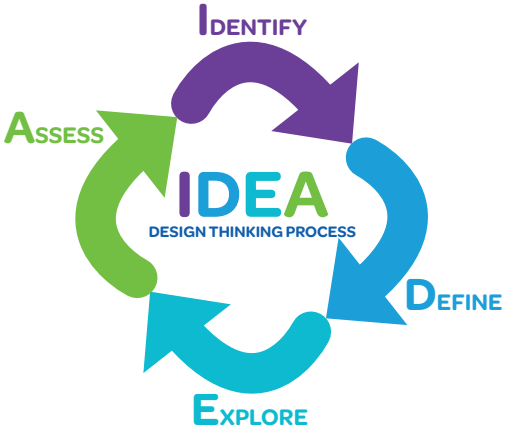
- Crayola® Crayons, Markers, or Colored Pencils
- Paper (scrap paper, construction paper, or a note pad)
- Recycled Cardboard (empty cereal box or thicker corrugated boxes)
- Tape

Prepare:

Schedule a convenient time to discuss the assignment and initial ideas. Children may come back to this project for short periods over several days.

Guiding Questions

- Why is doing research, including talking to others who use the household item, important for inventors and innovators to find new ideas?
- What questions will you ask others to learn more about problems they have using some household objects?
- Who can provide you with feedback as you develop ideas for a new design?



Applying the Design Thinking Process to this Lesson

- **IDENTIFY** which household object you would like to redesign to solve a problem or improve it.
- **DEFINE** possible solutions to the problem.
- **EXPLORE** many ideas and sketch possible new designs.
- **ASSESS** which solutions are best. How can they be revised, and can other ideas be connected? Which ideas are most practical, unique, affordable, or fun? What criteria will be used to determine which innovations are best?

- Discuss the goal of thinking either like inventors (they create new things) or innovators (they improve things that already exist) to solve problems with some household objects.
- **Identify** a problem within one household item or brainstorm a list of possible objects that could be improved to meet your family's needs.
- **Define** possible solutions. Generate many ideas. Research other types of solutions including those that might imitate nature. Interview others and blend their ideas into your solutions.
- **Explore** solutions by sketching new designs. You may want to build some three-dimensional prototypes or models to make your ideas clearer.
- **Assess** when the designs will be ready to share with others. While they might not be complete, works that are in progress can lead to helpful redesign discussions.

- Share sketches or three-dimensional models with others. Think creatively about ways to share your ideas. Perhaps send photos of what you created via email or text or have a video call on FaceTime or another remote communication app to share with family and friends who don't live with you.
- Ask questions to get ideas to improve the solution.
- Display completed work in a home design gallery on the refrigerator or on a bulletin board so they can spark more conversations and be added to or revised.

- Demonstrate as a family that innovators and inventors must be great listeners. They learn about problems and hear possible solutions when they listen to others. They use a flexible mindset that keeps their minds open to new ways to improve.
- When adults respond to a child's ideas by listening first and then asking respectful questions it helps children think through additional possibilities to make solutions better. Questions such as "What if..?," "I wonder when...?," and "Why?" show children that adults value their thinking.

- Extend this project to explore possible innovations to improve toys, cars, or foods. Ask children to redesign the storylines in books. Let children decide what else could happen to the characters or what other ways the story might end.

For Younger Children

- Young children are tinkerers who often get their ideas by physically manipulating objects and imagining what might not yet exist. Enjoy the power of young children's imaginations to dream up totally different ways an everyday object might take on magical characteristics. Fantasy can be fun!

For Older Children

- Help kids feel like inventors and innovators who focus on big ideas—the real-world problems they are concerned about now. "What if...?" is a wonderful open-ended question that helps adults hear what is on kids' minds.
- Innovation often happens alongside collaboration, where people build upon each other's ideas. Even when older kids cannot be with their friends, projects like this can bring them together virtually as they focus on solving a real problem.

Child Reflections

- What helps you think like an inventor or innovator?
- How many problems did you try to solve? How many other types of problems could we tackle the next time we do this project?
- When is it important to think and work alone, and when does it help to hear others' ideas or feedback?
- Which of the ideas that we explored today excite you the most and why?

Adult Reflections

- How did this project help me connect with my child(ren)?
- What did we learn about each other as we worked together on this project?
- What discoveries did we make while using the design thinking process? When will we use it again?

STANDARDS AND SKILL DEVELOPMENT

Educational standards outline what children should know and be able to do in the areas of Language Arts, Mathematics, Science, and Visual Arts. Use your imagination to modify the project to address specific standards from your child's curriculum, or create changes by responding to your children's interests and needs. This lesson aligns the following education standards:

LANGUAGE ARTS

- Read at the appropriate grade level to determine, analyze, and interpret key ideas and details, and integrate knowledge and ideas.
- Write using words, numbers, and images to inform and explain, share experiences, and develop real and imagined narratives.
- Produce and distribute writing. Research ideas to build and present what is known and imagined.
- Speak and listen to develop comprehension and presentation skills.
- Develop an increasing command of language conventions and vocabulary and use these accurately to communicate ideas and feelings.

MATHEMATICS

- Recognize, analyze, and repeat patterns.
- Describe, compare, and classify objects by attributes.
- Solve problems. Represent and interpret data.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.

SCIENCE

- Develop and use models.
- Plan and carry out investigations.
- Analyze and interpret results.
- Construct explanations and design solutions.
- Obtain, evaluate, and communicate information based on evidence.
- Investigate and explain cause and effect.
- Recognize what is relevant and how changes in scale, proportion, or quantity affect a system's structure or performance.

VISUAL ARTS

- Imagine and create art to convey meaning.
- Select, analyze, and interpret art for presentation.
- Apply criteria to explore and evaluate artistic work.
- Synthesize and relate knowledge and personal experiences to create, present, and/or respond to art.
- Elaborate on imaginative ideas.
- Use observation and investigation to prepare for making a work of art.
- Develop criteria that will guide your design process as you work to meet an identified goal.
- Repurpose objects to make something new.
- Design or redesign objects, places, or systems to meet the identified needs of diverse users.

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