Invention Boxes

Mid-Valley
STEM-CTE HUB

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Invention Boxes

The Invention Boxes STEAM Kit encourages students to think creatively, collaborate, and apply problem-solving skills in a hands-on, team-based environment. Each box contains an assortment of random materials, giving students the freedom to design and build inventive solutions to a given challenge. This kit fosters creativity, teamwork, critical thinking, and engineering design skills through open-ended exploration and experimentation.

Grade Level

5th grade - college

Group Size

2 - 3 students per group

Time Duration

30 - 120 minutes

Content of Kits

Components

- 10 Inventon Boxes
  - Contents are varied and may not be the same from one lending period to the next.

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Usage

How it Works

1. Break students into groups of 2-3 give them an invention box and instruct them to not look inside until the activity begins.

2. Give students the prompt, “Think about something you do often that isn’t fun.” Allow the groups a few minute to talk and find a cohesive idea and common problem to solve.

3. Go around the room and ask each group to complete this sentence out loud. “I wish I had a ____ that could ____.”

4. Set a timer for 5 - 10 minutes to build something using only what’s in the box and other approved items like adhesives or additional paper.

5. Have each group share their invention and process with the class.

6. Begin round 2 by swapping partners and/or inventions.

7. Give the class new prompts using protobot.org and see how they either modify existing inventions or create new inventions based on the prompt.

8. Have each group share their new or modified inventions. Have them reflect on how the constraints and/or fresh collaboration changed the process.

Storage

- Return all paper boxes and any reuseable items stored in them to the plastic bin provided to ensure breakable or small items are protected when the kit is not in use.

Troubleshooting

- **Students struggling to build:** Encourage brainstorming and sketching ideas first; remind students that there is no “wrong” solution. Offer suggestions or examples without providing full instructions.

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Learning Extensions

STEAM Connections: Engineering - Tech - Arts

Learning Objectives:

- Foster creativity and imaginative thinking.
- Build problem-solving and critical-thinking skills.
- Encourage collaboration and teamwork.
- Develop basic engineering and prototyping skills.
- Promote iterative design through testing and reflection.

Career Connections:

- **Engineer:** Designs and prototypes solutions to real-world problems.
- **Inventor/Entrepreneur:** Uses creativity and problem-solving to create new products or solutions.
- **Product Designer:** Applies design thinking and innovation skills to develop functional, usable products.
- **STEM Educator:** Guides students through problem-solving, design, and critical thinking processes.

Essential Employability Skills:

- Critical Thinking
- Problem-Solving
- Collaboration
- Communication
- Creativity
- Iterative Thinking
- Reflection
- Empathy

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Resources and Accessibility

Safety Guidelines

- Handle all tools and materials carefully.
- Use scissors, tape, and other sharp objects under supervision.
- Be aware of small materials to avoid choking hazards.

Accessibility

- Provide verbal and visual instructions for students with different learning needs.
- Allow flexible time and support for students with fine motor challenges.
- Encourage alternative materials or adaptations for students with sensory or mobility considerations.

Library Catalog

Library Resources

Feedback

QR to feedback survey