

# STEM - How Odyssey of the Mind Fulfills STEM Objectives

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## Stem Core Concepts

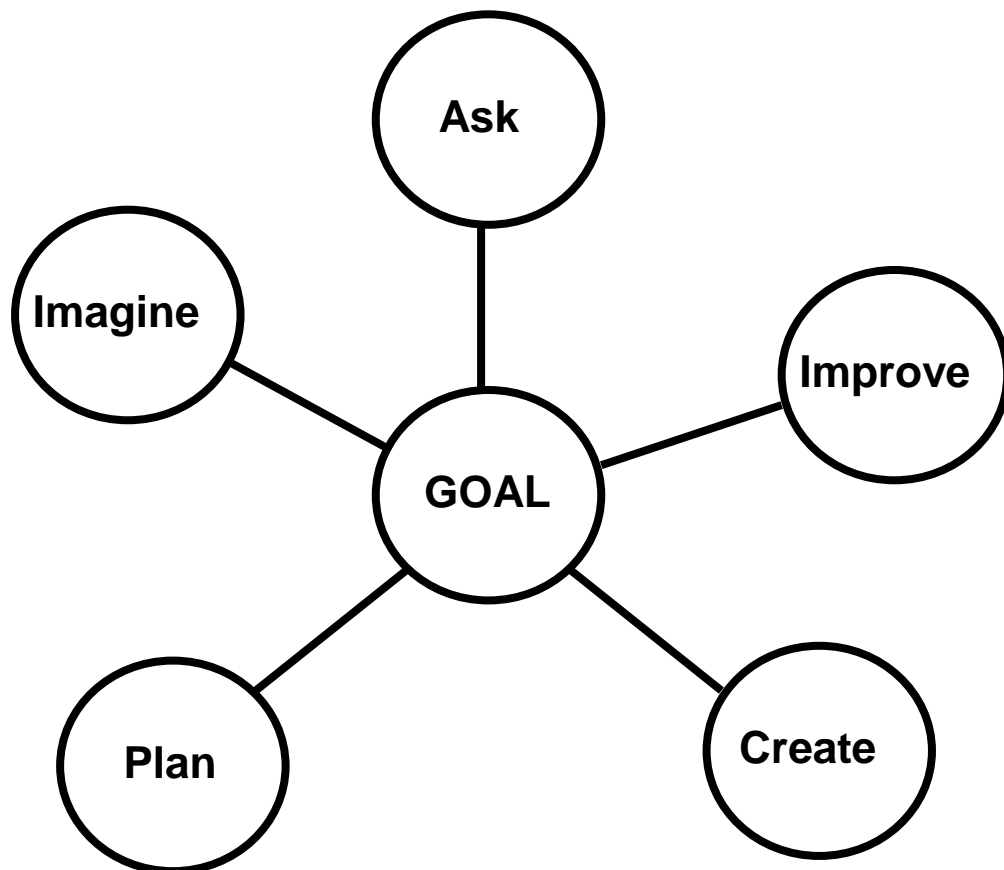
### 21st Century knowledge and skills

- Communications
- Problem solving
- Critical thinking
- Information technology applications
- Systems thinking
- Safety, health, and environment
- Leadership and teamwork
- Ethics and legal responsibilities
- Creativity, invention, and Ingenuity

### Improved STEM programs can create individuals capable of new solutions and better decisions

- Increased science and math capability is not enough
- Experiences centered on design, innovation, engineering, and technology will increase creativity, inventiveness, ingenuity, and imagination capabilities
- These characteristics are fostered in STEM centered learning experiences

## Engineering Design Process



**GOAL**

Identify the need/problem.

**ASK**

Identify all known facts related to the need or problem. Identify information that is not known but essential to the situation. Identify what is happening now in relation to the need or problem. Explore other options via the Internet, library, interviews, etc.

**IMAGINE**

Brainstorm possible solutions. Draw on mathematics and science. Choose the best solution for action by using a list of selected criteria.

**PLAN**

Create a list of necessary materials. Determine the steps in the process of creating the solution. Draw a diagram to match the steps. Troubleshoot to avoid possible problems.

**CREATE**

Construct the prototype. Follow the plan to implement the solution. Test it!

**IMPROVE**

Evaluate the solution. Redesign the prototype after each trial to gain maximum success.

## **Both STEM Education and Odyssey of the Mind Develop These Skills and Characteristics in K-12 Students:**

Problem-solving--able to define questions and problems, design investigations to gather data, collect and organize data, draw conclusions, and then apply understandings to new and novel situations.

Innovation--creatively use science, mathematics, and technology concepts and principles by applying them to the engineering design process.

Inventing--recognizes the needs of the world and creatively design, test, redesign, and then implement solutions (engineering process),

Self-reliance--able to use initiative and self-motivation to set agendas, develop and gain self-confidence, and work within time specific time frames.

Logical thinking--able to apply rational and logical thought process of science, mathematics, and engineering design, to innovation and invention.

Technological literacy--understand and explain the nature of technology, develop the skills needed, and apply technology appropriately.