

# **Whirli-gig Robotics Contest Prompt**

## **Lesson Plan generated by MagicSchool.ai**

Objective: Students will be able to design, build, and code their own unique whirligig powered by a robot.

Assessment:

- Students will create a video showcasing their whirligig in action and post it on a the TCEA social platform.

Key Points:

- Understanding the concept of whirligigs and their variations.
- Exploring different power sources for whirligigs.
- Designing and building a whirligig powered by a robot.
- Coding the robot to control the motion of the whirligig.
- Creating a video to showcase the functioning of the whirligig.

Opening:

- Show a video or image of different types of whirligigs.
- Ask students if they have ever seen or played with a whirligig before.
- Engage students in a discussion about how whirligigs work and what makes them spin.

Introduction to New Material:

- Explain the concept of the Engineering Design Process and its importance in creating whirligigs.
- Discuss the different power sources for whirligigs, including wind, hand power, friction, and motors.
- Address the variation of whirligigs, such as pinwheels, buzzers, and whirlybirds.
- Anticipate the misconception that whirligigs can only be powered by wind.

Guided Practice:

- Set behavioral expectations for the work time, such as collaboration, active participation, and following instructions.
- Provide examples of different whirligig designs and their corresponding robot coding.
- Scaffold questioning from easy to hard, asking students to explain the purpose of each component in their designs.
- Monitor student performance through observation and provide guidance and feedback as needed.

#### Independent Practice:

- Reinforce behavioral expectations for the work time.
- Assign students to design, build, and code their own whirligig powered by a robot.
- Provide necessary materials and tools for students to construct their whirligigs.
- Encourage students to be creative and think critically about the design and functionality of their whirligigs.

#### Closing:

- Have students gather in a circle or small groups.
- Ask each student/group to share one key aspect of their whirligig design and explain how they coded the robot to control it.
- Summarize the main points discussed during the lesson and emphasize the importance of innovation and creativity in engineering.

#### Extension Activity:

- For students who finish early, challenge them to create a second whirligig design with different features or functionalities.
- Encourage them to experiment with different materials and coding techniques to enhance their whirligigs.

#### Homework:

- As a homework activity, suggest that students research historical references to whirligigs and their significance in different cultures.
- Ask them to write a short paragraph summarizing their findings and how these references relate to the engineering design process.

#### Standards Addressed:

- Next Generation Science Standards (NGSS): MS-ETS1-1, MS-ETS1-2