Rubber Band Powered Cars

Overview:
In this unit students will learn the fundamentals of the DIDI 500 and work towards competing in the area DIDI 500 at St. Bonaventure University. Teams will be given a limited budget to purchase construction materials, construct a rubber band powered car that can travel as far and as straight as possible while carrying two weights and develop a persuasive marketing pitch. The students will be introduced to the program by watching a series of videos. Although given suggestions, the students will brainstorm a list of possible supplies
Design It! Build It! Test It! Race It! Sell It!

Goal: Students will learn about the DIDI 500 program, build rubber and powered cars, and compete in the area DIDI 500.

Unit duration: 5 weeks

By the end of this unit, students will be able to:

- Create a design plan for a rubber band car.
- Follow a budget
- Build a rubber band car.
- Test the car – using the 5 Whys
- Race the rubber band car.
- Market the rubber band car.

Materials (suggestions)

- Rulers
- Scissors
- Cardboard
- Sandpaper
- Pencils
- String
- Rubber bands
- Tape
- Paper
- Glue
- Pens
- Weights
- Other items from student brainstorming

Resources
- DIDI 500 rule book
- Videos

Timeline
2 months prior: Planning/budget
1 month prior: Order supplies
2 weeks prior: Ensure all materials have arrived
1 week prior: Prepare for lessons

Activity Overview

Week	Activity	Activity outline	Guiding questions
1	**Exploring the DIDI 500**	Students will watch videos, giving information about the DIDI 500. They will also watch the HCS team win the competition in 2017. Have students engage in a discussion about building cars, brainstorm a list of materials, and find a partner or group of four. Examine past cars to see how they could be improved upon.	How do you think they build their car? What do you see that was different in 2017? What materials would you like to use?
2	**Design/Build Car**	Students will begin by designing the car and drafting a model. Perhaps have an engineer or drafter come in to work with the students on the Engineering Design Process. Students will be given a kit with supplies to use. The listed criteria will be followed: • Car must be propelled by rubber bands • Use only materials provided • Car must carry 2 weights • Car must travel as fast and as straight as possible.	How will your car work? What does it need to move?
3	**Continue Building**	Students will continue to build cars. The testing process may begin when the cars are close to completion. While testing the cars, engage in the 5 Whys. Why is it not moving? Why is it turning right? Why did it go backwards? Possibly invite guest speakers from SBU ENACTUS or previous participants to discuss the DIDI 500.	What isn't working? What might you need to do differently? How could you increase the speed?
4	**Complete Building** **Begin Marketing Plan**	Students will finish building cars and continue testing. When finished, begin the marketing process. Students will make a plan to market their cars to an audience of professionals. The marketing pitch will include the following criteria: • 2 – 3 minute pitch • may use props • Creative "commercial" • Convince panel - "Our car is the best!" Practice race.	How are you going to promote your car? What are your cars best features?
5 Possibly 6	**Car Race** **And** **Marketing Competition**	Students will race cars. The car that stays on the track and goes the farthest wins the racing part of the competition. Students will present their cars. The car that gets the most votes as the best wins this part of the competition.	What have you learned from this experience? Is winning the only goal? Will you be participating in the DIDI 500 at SBU?

5 & 6 (cont'd)		This may include an event with a bigger audience, include other schools, or simply be a practice for the SBU DIDI 500 in November.	

Judging Criteria

Category	Criteria	Scale	Score
Design	Followed Engineering Design Process. Define the Problem Do background research Specify requirements Brainstorm solutions Choose best solution Do development work Build prototype Test and redesign	4-5 – Excellent 2-3 – Satisfactory 1 – Unsatisfactory 0 - Missing	
Methodology/Construction	Rubber band powered	4-5 – Excellent 2-3 – Satisfactory 1 – Unsatisfactory 0 - Missing	
Testing	Identify problems and solutions	4-5 – Excellent 2-3 – Satisfactory 1 – Unsatisfactory 0 - Missing	
Creativity	Shows creativity and innovation	4-5 – Excellent 2-3 – Satisfactory 1 – Unsatisfactory 0 - Missing	
Presentation Race	Clear and professional Thoughtful responses to questions Placement in race	4-5 – Excellent 2-3 – Satisfactory 1 – Unsatisfactory 0 – Missing	
		Total	