Cooperative Car Creations

Lesson at a glance:

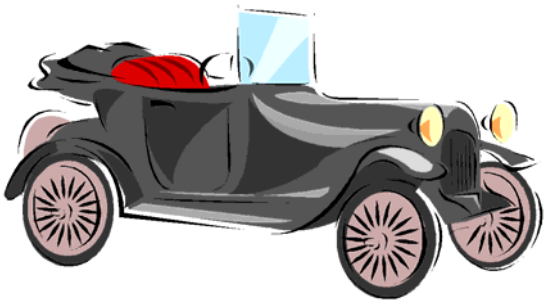
Students will work cooperatively in pairs to design and build a car. In the process they will practice problem solving and critical thinking skills while working with limited materials.

Skills:

Observing, Predicting, Experimenting, Communicating, Cooperating, Creating

Grades:

3-5



Materials:

Per two students

- Three 3”x5” pieces of corrugated cardboard
- One plastic straw
- Two 3/16” diameter wooden dowels each 4” long
- Tape
- Four paper clips
- Compass
- Scissors
- One cubic inch rubber eraser
- One piece of thick cardboard about 28” long } for ramp
- Three thick books
- Ruler

Diagram of potential car:

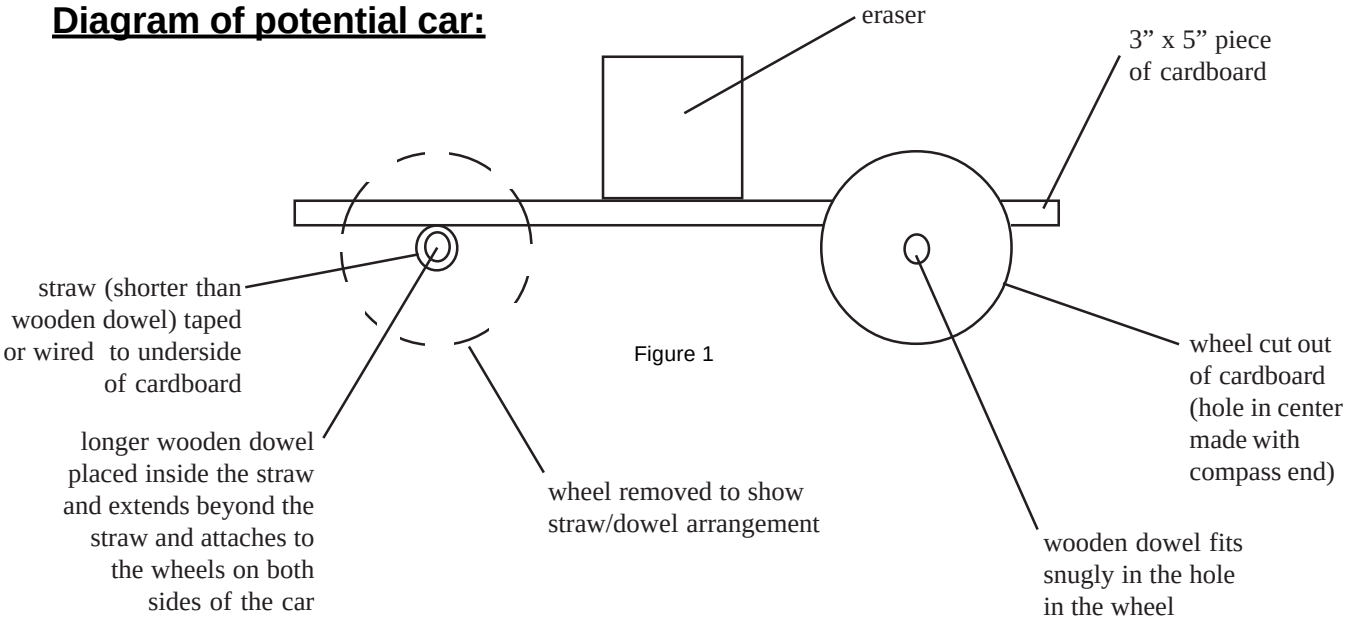


Figure 1

Activity:

1. Divide your students into groups of two.
2. Hand each pair their supplies and explain that they are to use these materials to construct a car that will roll down a ramp while supporting an eraser.
3. Explain that they will be using the large piece of cardboard, books and tape to create their ramp. (Figure 2)

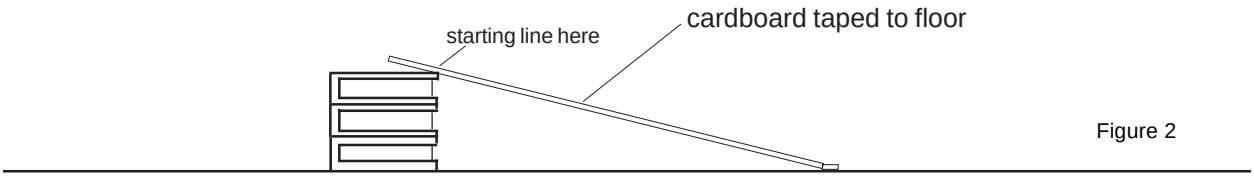


Figure 2

4. Give the students 30 minutes to create their car.
5. At the time limit, have the students draw a straight line across the width of the large piece of cardboard six inches from one end of the board. Explain to the students that this line will serve as the starting line for the car.
6. Have each pair construct a ramp by stacking three thick books on top of each other and then placing the end of the board with the starting line on top of the books. Tell the students to line the starting line up with the edge of the stack and to apply tape at the base of the ramp to keep it in place.
7. Have the students place the car immediately behind the starting line and release it. Tell the students they are not to give the car a push.
8. When the car has stopped, have each team measure the distance their car traveled from the lower end of the ramp to where it came to rest (measured to the rear wheels).
9. Have them run three trials and calculate the average distance traveled. (The sum of the distances divided by the number of trials equals the average distance traveled.)

Discussion:

1. Have each team discuss what happened. Which team's car traveled the farthest?
2. What would each team do to change their design?
3. What tools would they have used or what materials would they have added to create a better car?

Assessment:

1. Use the **Collaborative Work Skills Assessment Rubric**

Extensions:

1. Have students look for other materials at home that they could add to their cardboard car body and have them bring these to class so they can continue building. Make sure the students understand that the materials they choose must be everyday household items and not parts taken off a toy car (such as wheels, for example).

Extensions (continued):

2. Have each pair of students present their new car to the class and discuss the problem solving methods that they used to come up with their final product.
3. Ask students:
   Did adding new materials help your car function more effectively or did it create more problems?