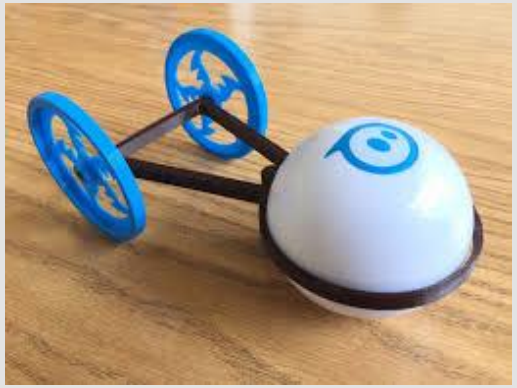
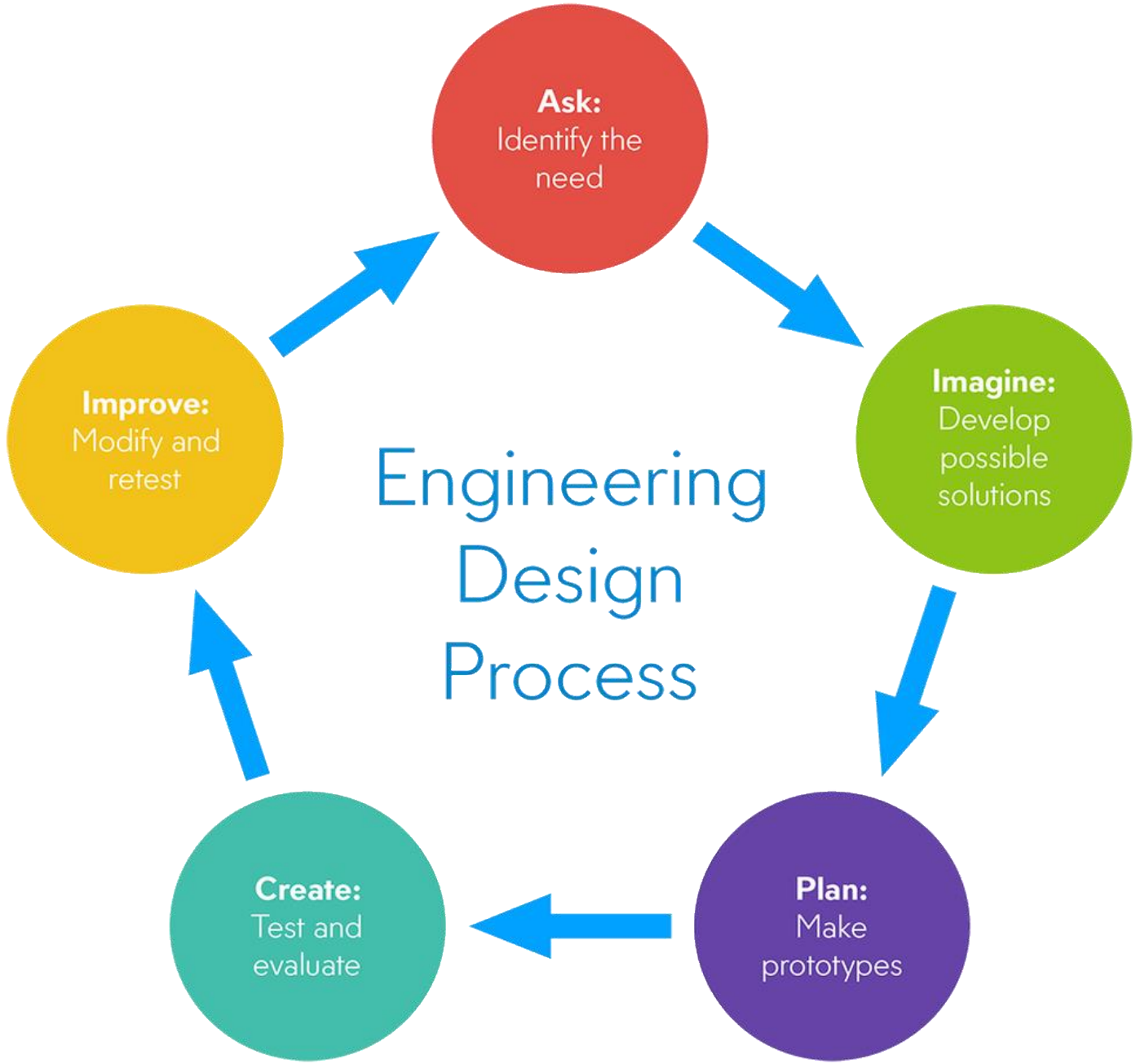
Sphero Chariot Challenge

Objectives:

- I will identify how Sphero can power a land-based vehicle constructed with inexpensive materials.
- I will drive Sphero around a defined course with a chariot attached.
- I will analyse the effectiveness of your work with supporting facts; reflect on the learning.




Ask:
Identify the need
Imagine:
Develop possible solutions
Plan:
Make prototypes
Create:
Test and evaluate
Improve:
Modify and retest
Engineering Design Process

Exploration - History of Chariots

- In ancient times, people used something called a "chariot" (a cart, usually pulled by horses) to haul materials, build things or even race against each other.

Draw a sketch of what a horse-drawn chariot looks like. Be as detailed as possible, but draw based on what you already know. Don't look online (yet!)

Exploration - Research Different Chariots

- *What materials were they made of?*
- *How many wheels did they have and how big were the wheels?*
- *How many horses/other animals were used to pull them?*

Research chariots online. Find photos and videos, noting their design and function.

Exploration - Designing your chariot

- *Will you use wheels?*
  - *What kind and size?*
  - *What will you use for an axle?*
- *Which chariot design might work best? Why?*

Examine the chariot construction materials you have to build with. Brainstorm some possible designs by experimenting with the materials.

SUPPLIES

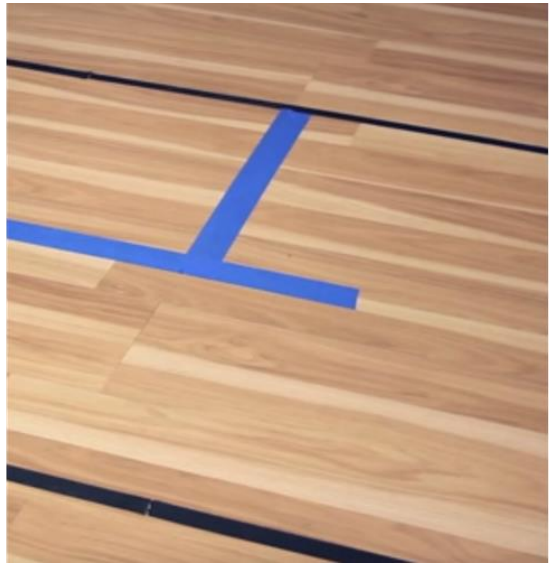
Paper, tape, cardboard, Meccano, tissues,, cups, large space on the floor for building the track, tin foil, paper, hot glue, craft sticks, straws, paper clips.

Exploration- Build Your Track

If you are running into issues:

- *Is the chariot too heavy for Sphero to pull?*
- *Are the wheels stuck?*

If you or your class hasn't already, build an oval track on the floor measuring 4 metres long and about 1.5 metres wide.



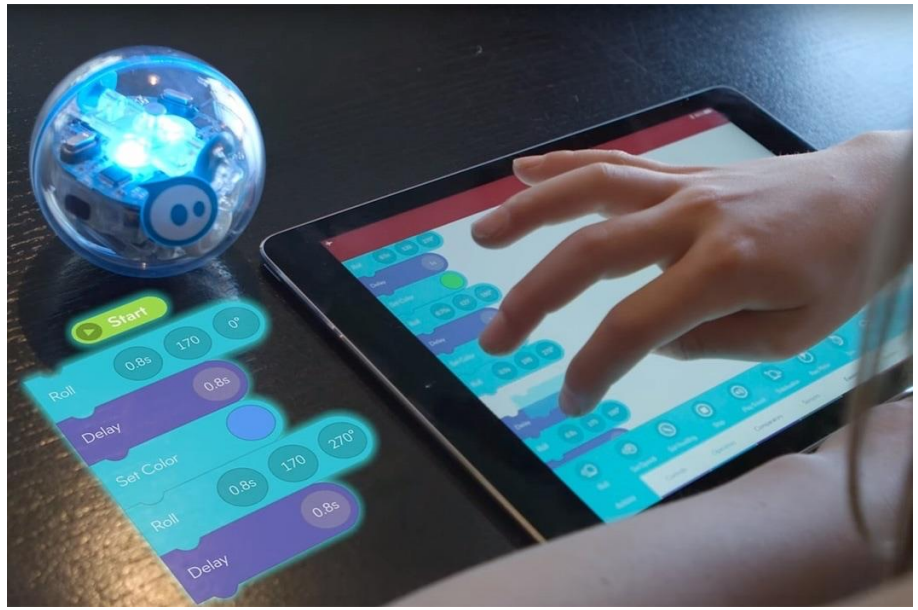
SUPPLIES

Masking tape, ruler

Skills Building/Testing: Autonomous Chariot

- At this point, you should take some time to practice driving your chariot around the track.
- Keep in mind that faster isn't always better when it comes to Sphero and chariots.
- *Why might that be?*

Create a code that enables Sphero to complete the course autonomously; in other words, it works on its own. This code can be used on an opponent during the upcoming chariot race.



Observe how your chariot and Sphero move. *Is there anything you can adjust or change to make it better?*

Challenge - Chariot Race

- Be sure to take some pictures or record a video to share.
- Airplay the video to Miss M's laptop

Time to put your Sphero Chariot up against your autonomous program and your classmates chariots.

Challenge – Redesign and Data Analysis

- Time the Sphero Chariots around the track.
- Compile best times in a spreadsheet.
- Evaluate each chariot by listing the materials and weighing it with and without Sphero.
- Discuss what made that chariot faster or slower than the others.

How can we make the Sphero Chariots faster? Let's gather data, evaluate the results, and make some predictions.

Reflection

Write your reflections on this activity and discuss with the class.

What worked and what didn't?

How would you do things differently in the future?

Why do you think that the culture you studied used the chariot that they did?

What materials worked best?

What was the most challenging part of the activity?

How did the size of the wheels or other design characteristics impact the results?

What materials worked best?

What was challenging and what worked well within your team?