

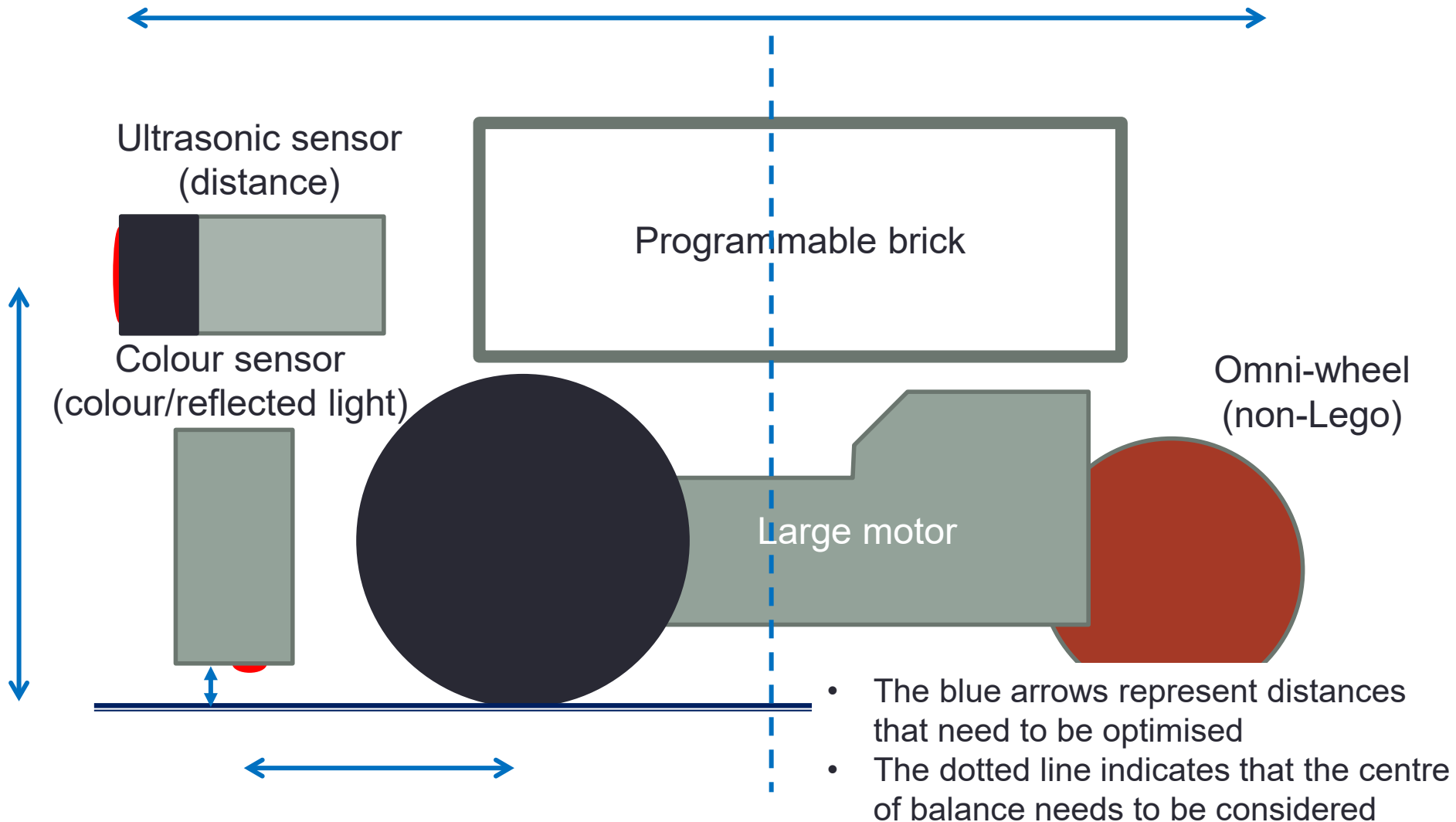
# ROBOCUP JUNIOR VICTORIA

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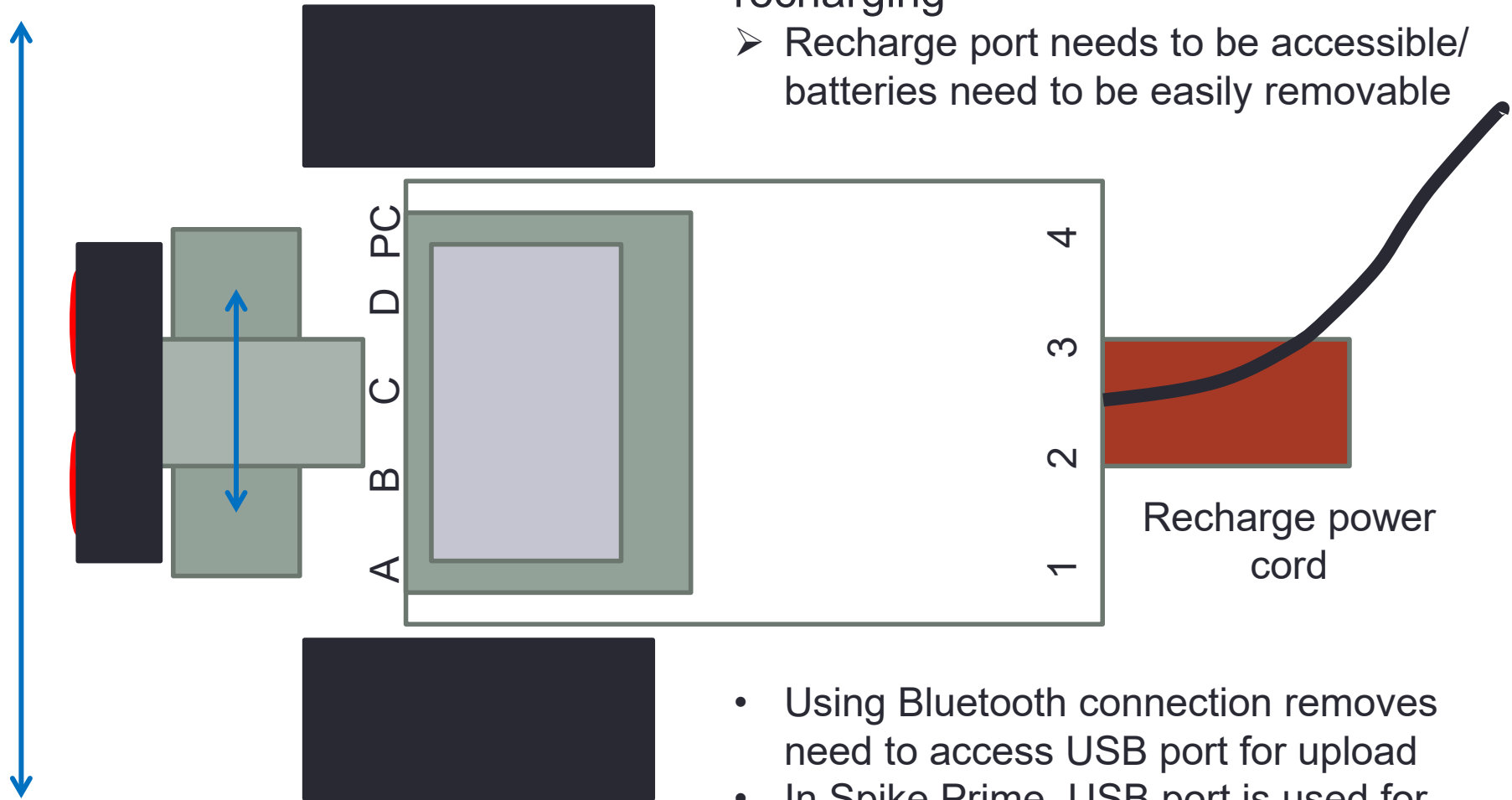
## Robot design

- What are some of the design considerations?

# Robot Side View



# Robot Top View



Consider need to update code

➤ PC upload port needs to be accessible

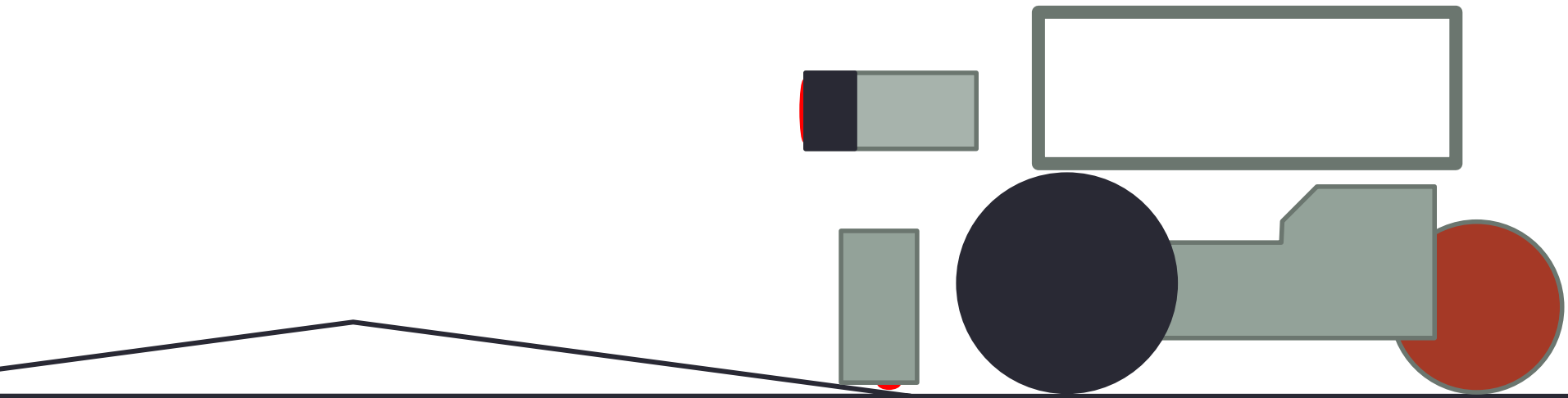
Consider need for battery replacement/  
recharging

➤ Recharge port needs to be accessible/  
batteries need to be easily removable

- Using Bluetooth connection removes need to access USB port for upload
- In Spike Prime, USB port is used for both code upload and recharging

# Physical Challenges

## The Bridge (in all competition levels)

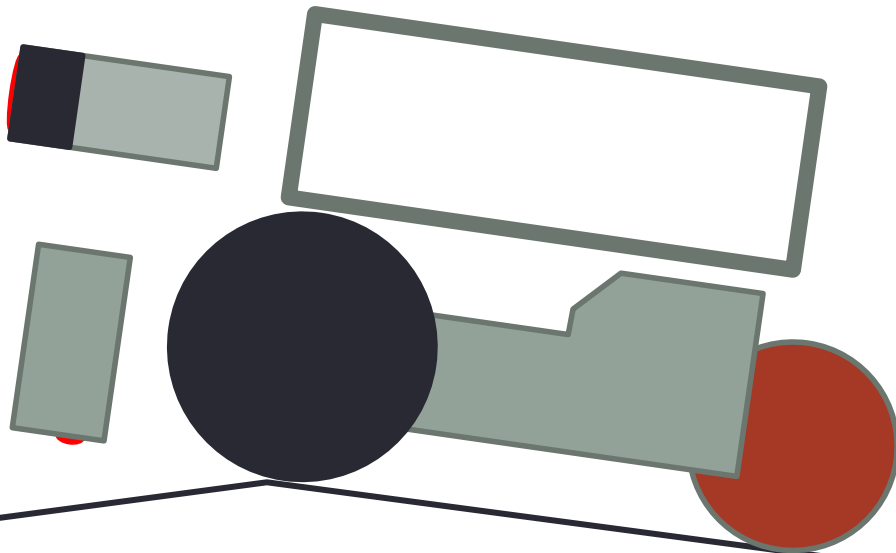


### Pitfalls

- Fixed sensors too close to the surface
  - Affects sensor readings
  - May impact movement, if in contact with surface

# Physical Challenges

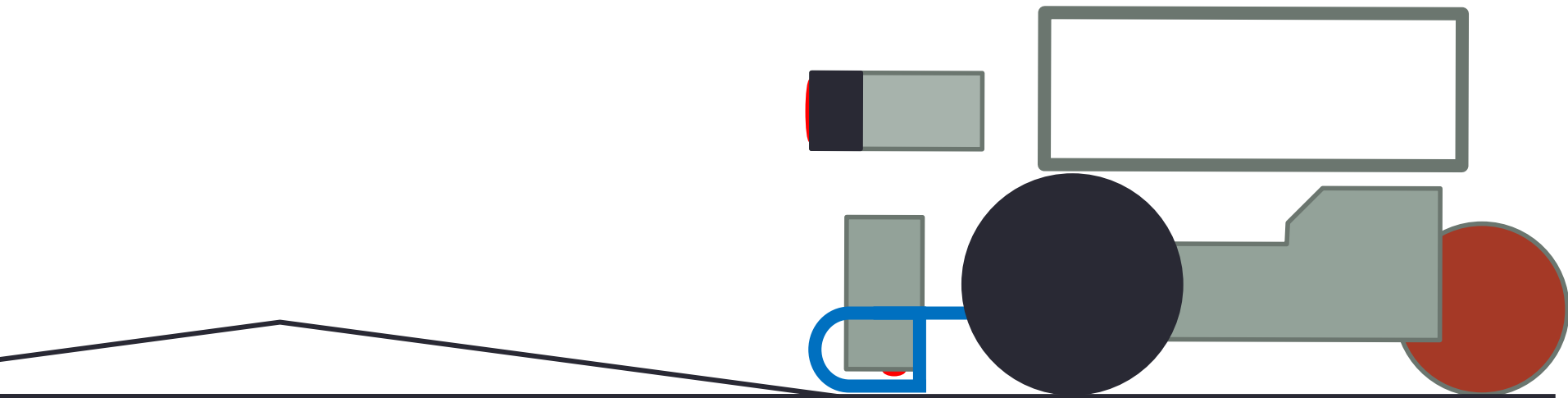
## The Bridge (in all competition levels)



### Pitfalls

- Fixed sensors too close to the surface
  - Fixed sensors too far from the surface (not always a problem)
    - Affects sensor readings
- Consider “floating” sensors

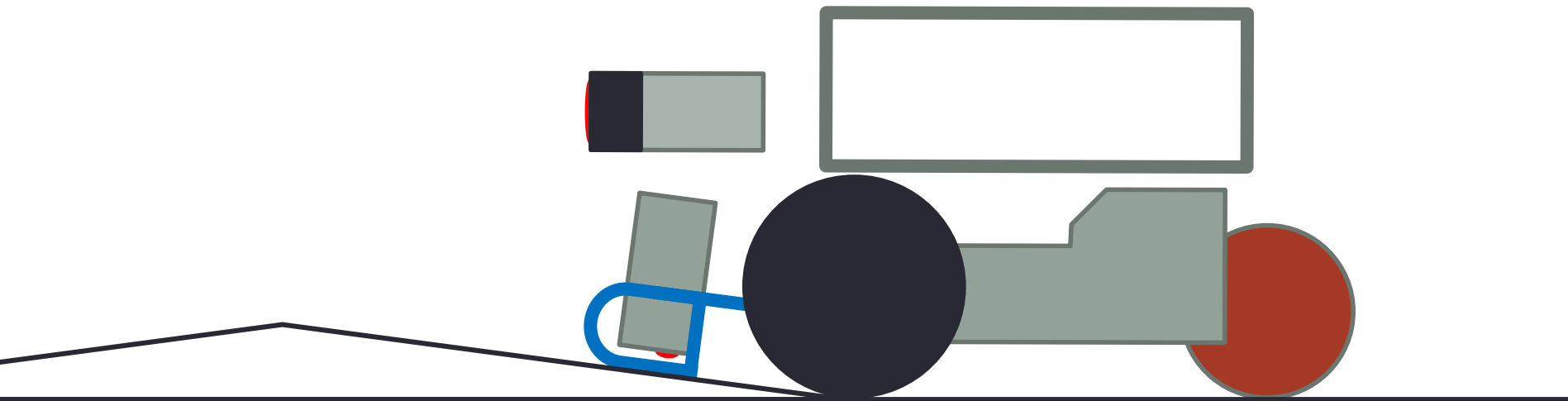
# Floating sensor



## What is a “floating sensor”?

- The sensor will move up and down with the contours of the mat
- There are many variations on construction involving, wheels without tires, pieces with gentle curves (in NXT sets, not EV3 or Spike Prime), etc.
- The “frictionless” peg connectors (grey or tan) can be very useful for this

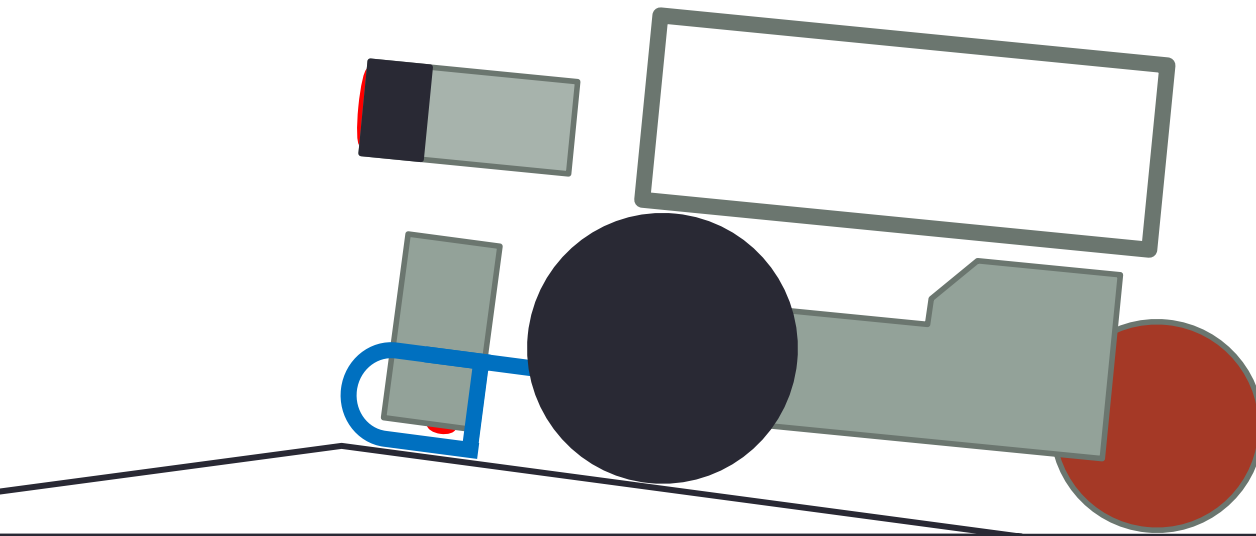
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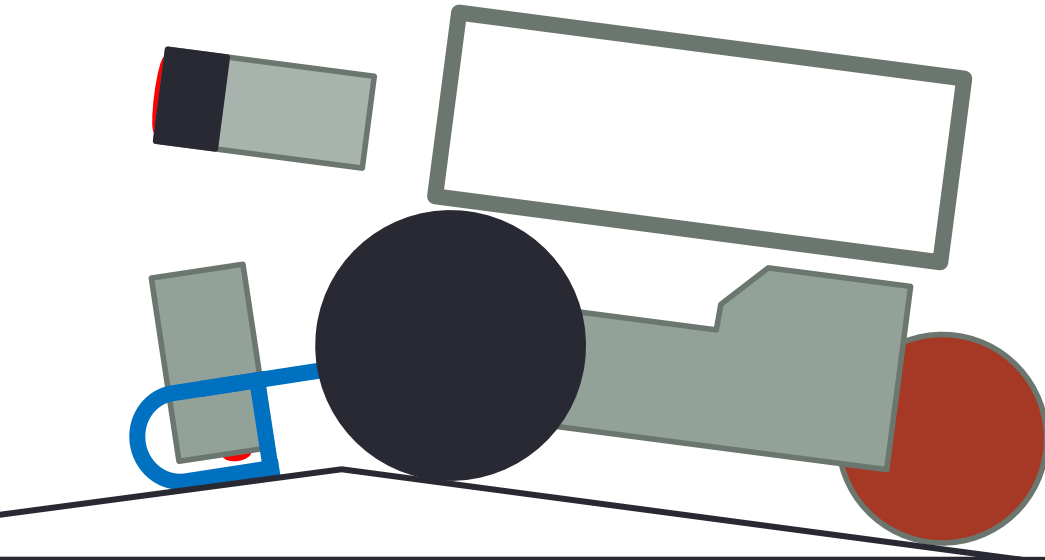


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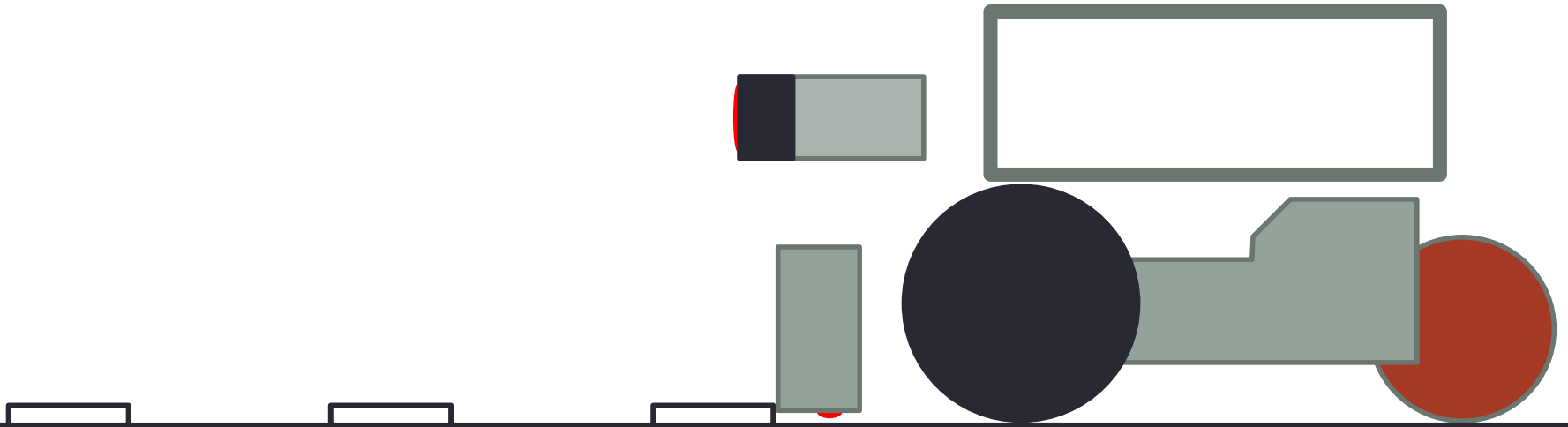
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# Physical Challenges

## Speedbumps

5 mm high, 30 mm deep, 200 mm wide



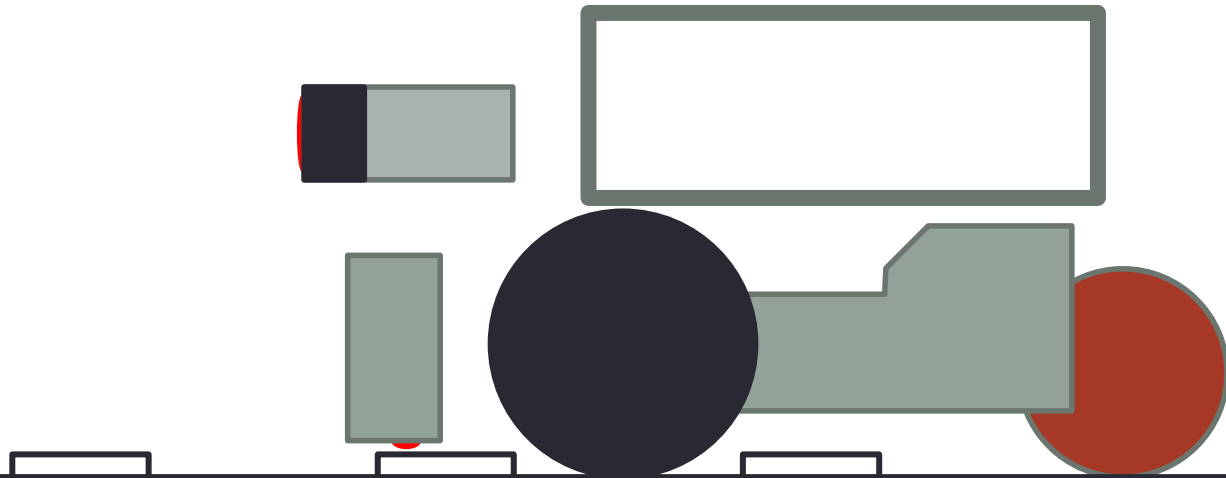
### Pitfalls

- Fixed sensors catch on speed bump (consider raising or floating sensors)

# Physical Challenges

## Speedbumps

5 mm high, 30 mm deep, 200 mm wide



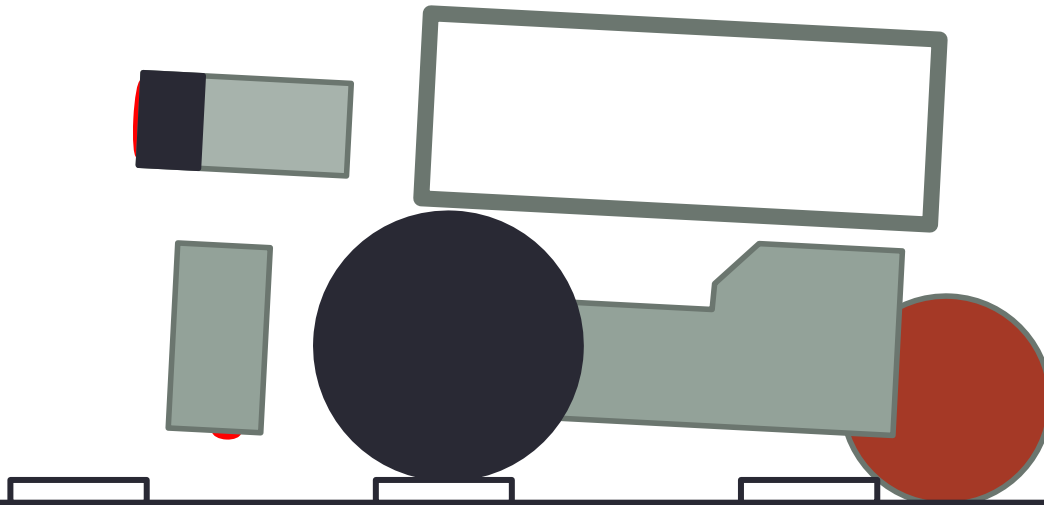
## Pitfalls

- Fixed sensors catch on speed bump (consider raising or floating sensors)
- Fixed sensors too close to the surface (sensors should be about 1 Lego beam width off the surface; ~7 mm)

# Physical Challenges

## Speedbumps

5 mm high, 30 mm deep, 200 mm wide

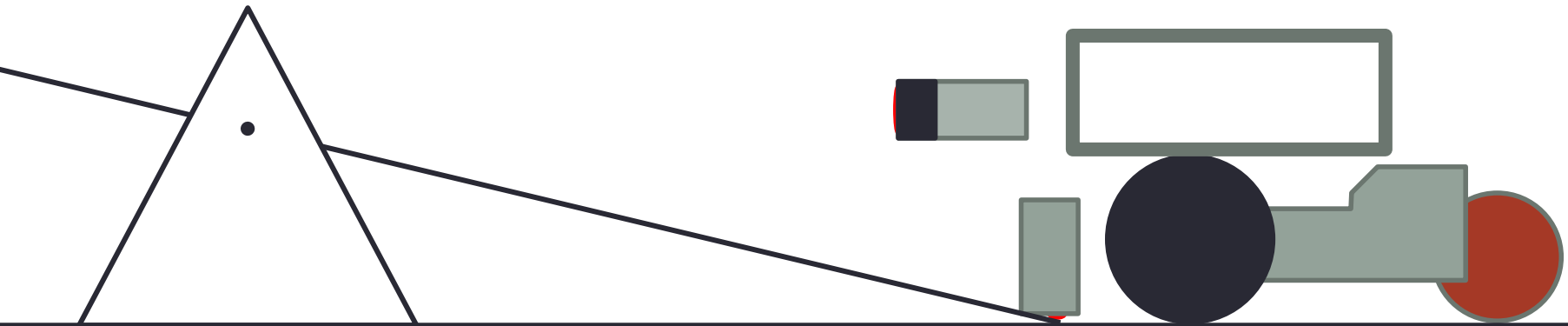


## Pitfalls

- Fixed sensors catch on speed bump (consider raising or floating sensor)
- Fixed sensors too close to the surface (sensors should be about 1 Lego beam width off the surface; ~7 mm)
- Lego ball caster can get stuck on speed bumps (use Omniwheel or alternative glide mechanism)

# Physical Challenges

## The See-Saw

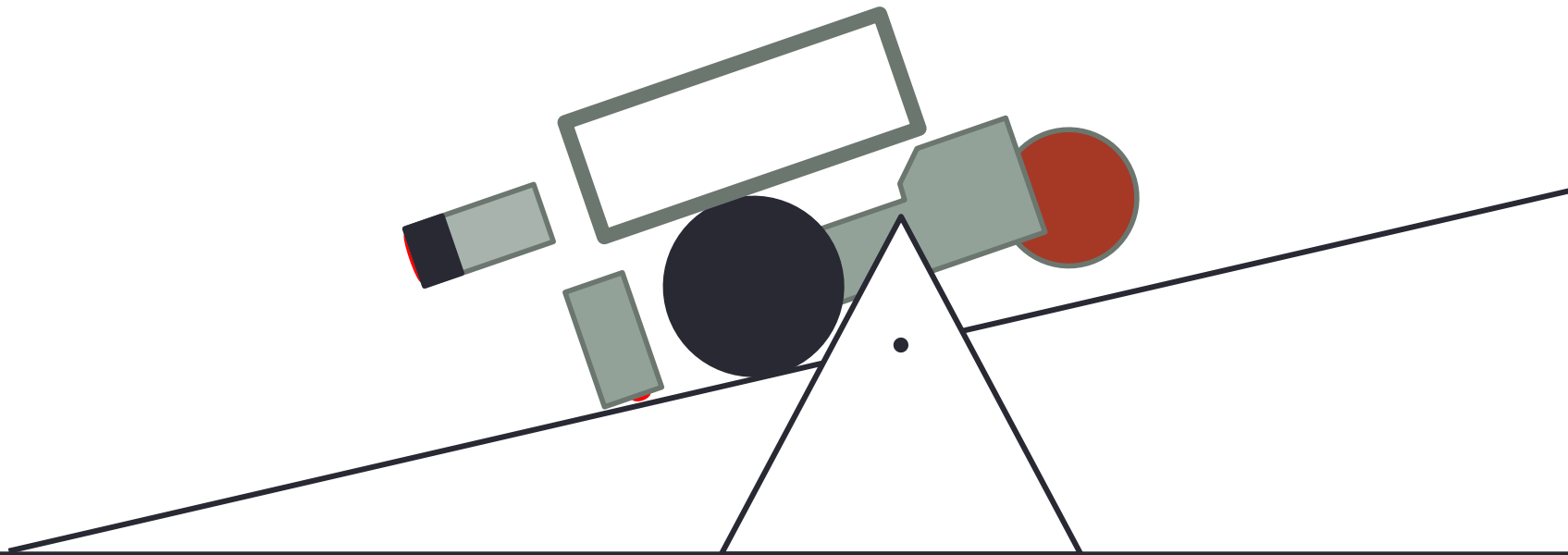


### Pitfalls

- Fixed sensors too close to the surface (light/colour readings are off)

# Physical Challenges

## The See-Saw

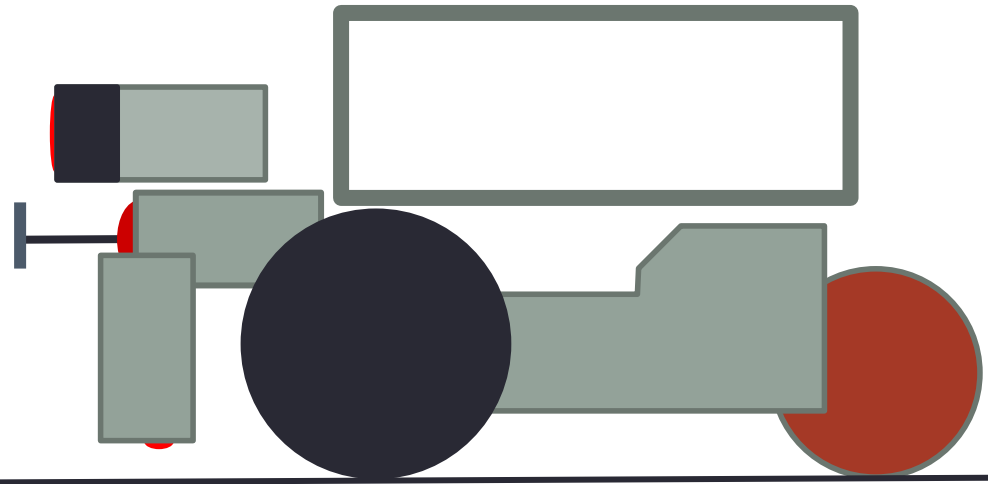


### Pitfalls

- Fixed sensors too close to the surface (light/colour readings are off)
- Centre of balance too far forward; robot overbalances (not always a problem, but easily fixed)

# Physical Challenges

## The Water Tower



### Decision

- Which is the best sensor to use?
  - Ultrasonic? (might this mistakenly see other objects as the water tower?)
  - Touch? (is the bumper mechanism sensitive enough?)