



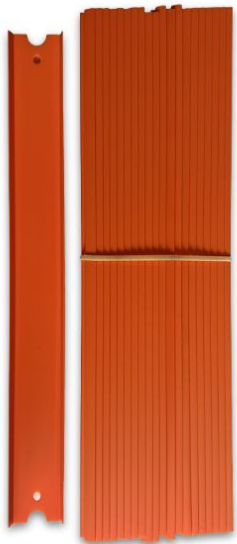
# FORCES AND MOTION CLASSBOX

Betabox Learning

# REQUIRED MATERIALS

## Provided in 1 Classbox

- 4 Hot Wheels cars
- 4 Car launchers
- Multiple long and short tracks
- 4 ramp supports (for jumps)
- Multiple single track connectors
- 4 dual track connectors (for circular ramp)
- 4 tape measures
- 4 balloons
- 3 play-doh tubs
- >10 yards of fabric (satin, burlap, elastic knit)



20 long tracks

9 short tracks

4 x-short tracks



4 hot wheels cars



4 car launchers



4 ramp supports



4 car stoppers



4 balloons



3 fabric rolls  
(burlap, elastic knit, satin)



29 single track connectors



4 dual track connectors



3 play-doh tubs



4 tape measures

# ADDITIONAL MATERIALS

## Not Provided in Classbox



- Tape



- Scissors



- Digital scale



- Straws



- Books



- Coins, washers, or small weights



- Calculators



- Stopwatch or download a video/stopwatch app to record videos with accurate timestamps



- Phone or camera to take video



- Optional: Additional surfaces/fabrics (e.g. wax paper, sand paper, tulle, vinyl, felt, etc)

# LESSON 1: KINETIC AND POTENTIAL ENERGY

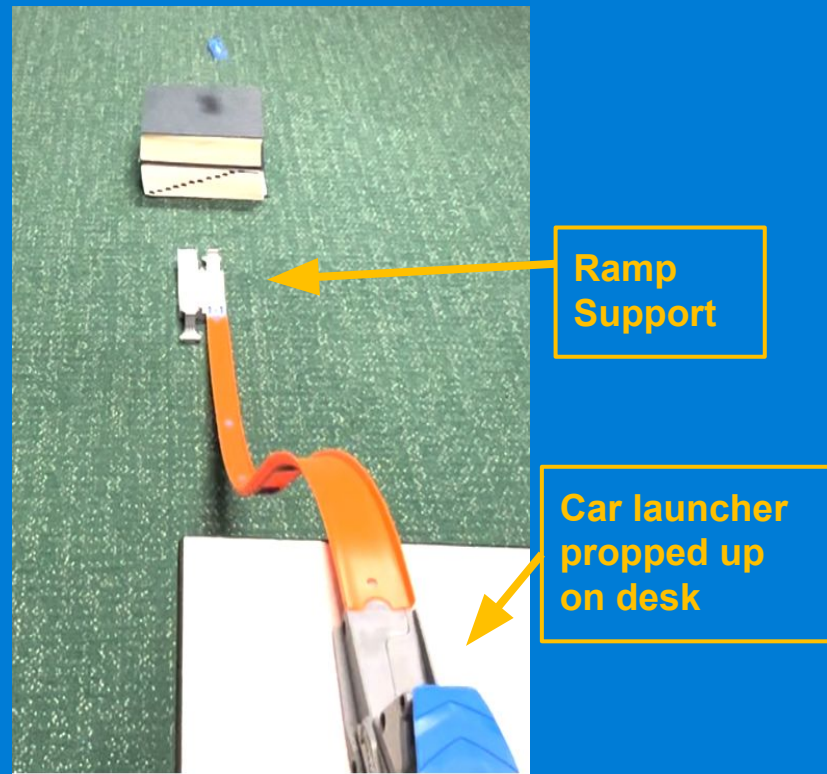
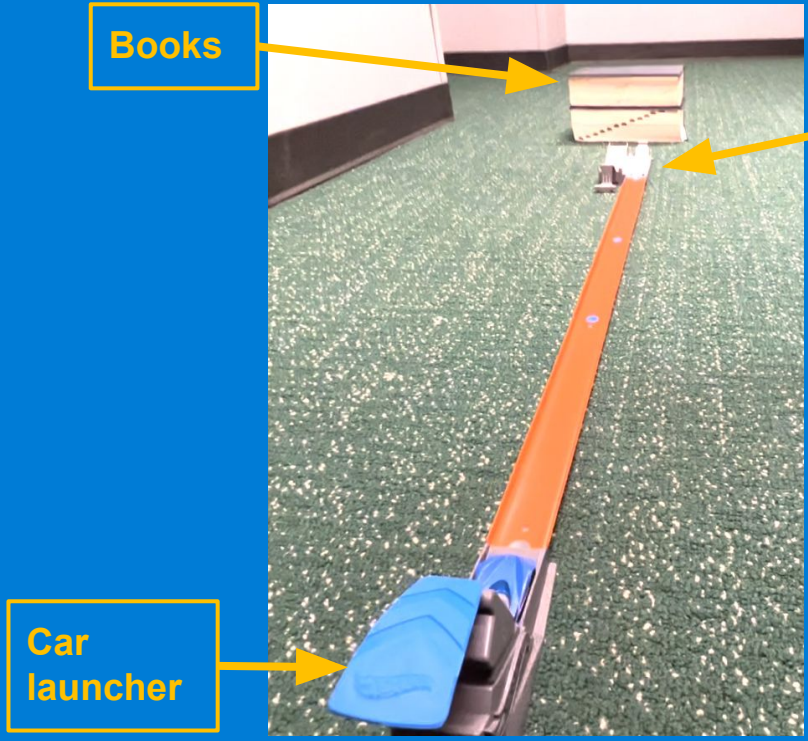
Small piece  
of clay



Car with  
straw taped  
on top

Car  
launcher  
propped up  
by desk and  
books

# TEACHER DEMO: KINETIC AND POTENTIAL ENERGY

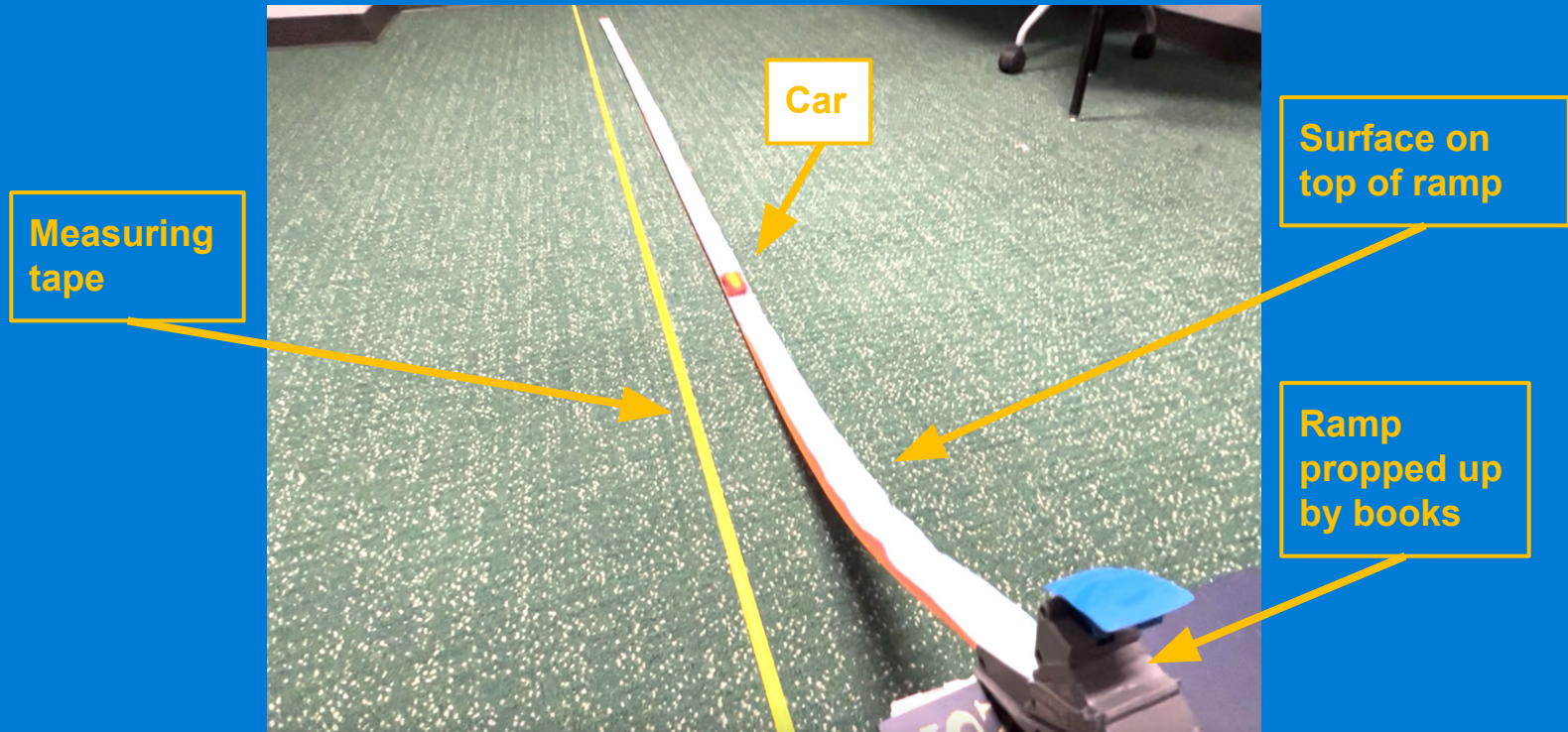


# Ramp Support - Attachment

**Slide the ramp support into the track**



## LESSON 2: FRICTION





# LESSON 3: INERTIA

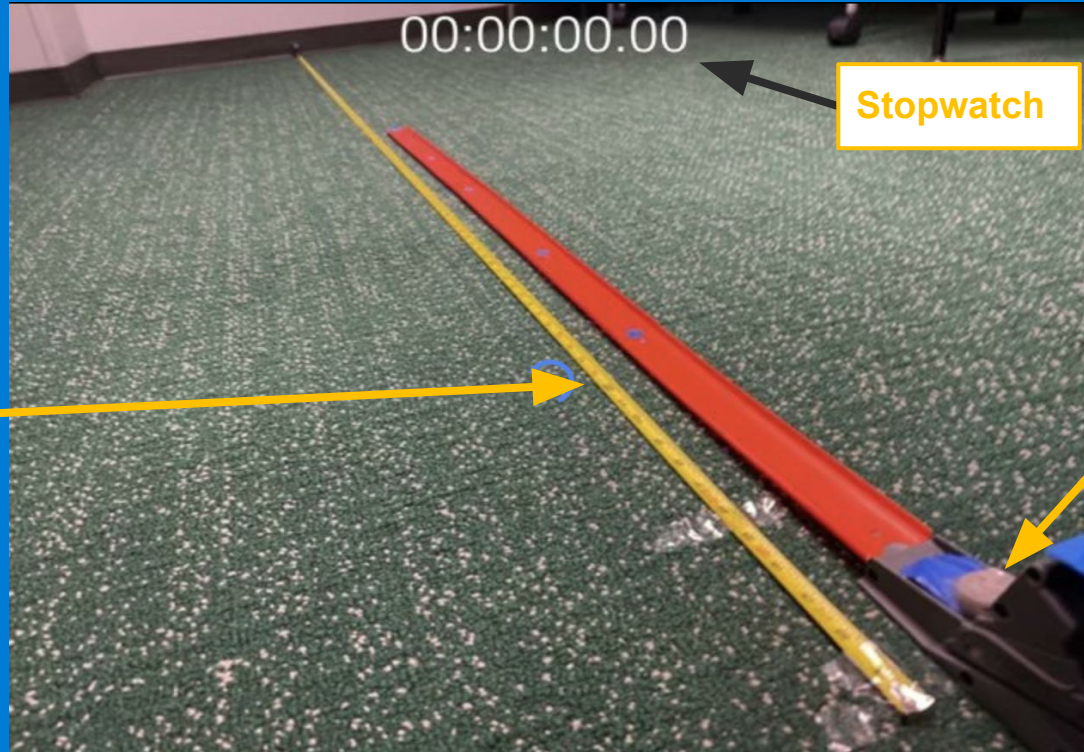
Car launcher  
propped up on  
desk

Clay lightly  
taped on top  
of car

Car stopper



# LESSON 4: ACCELERATION

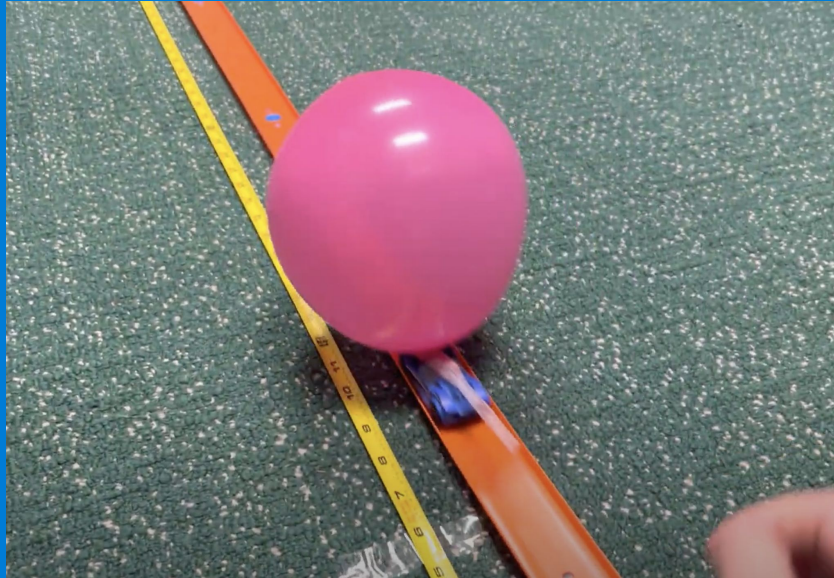


Tape measure

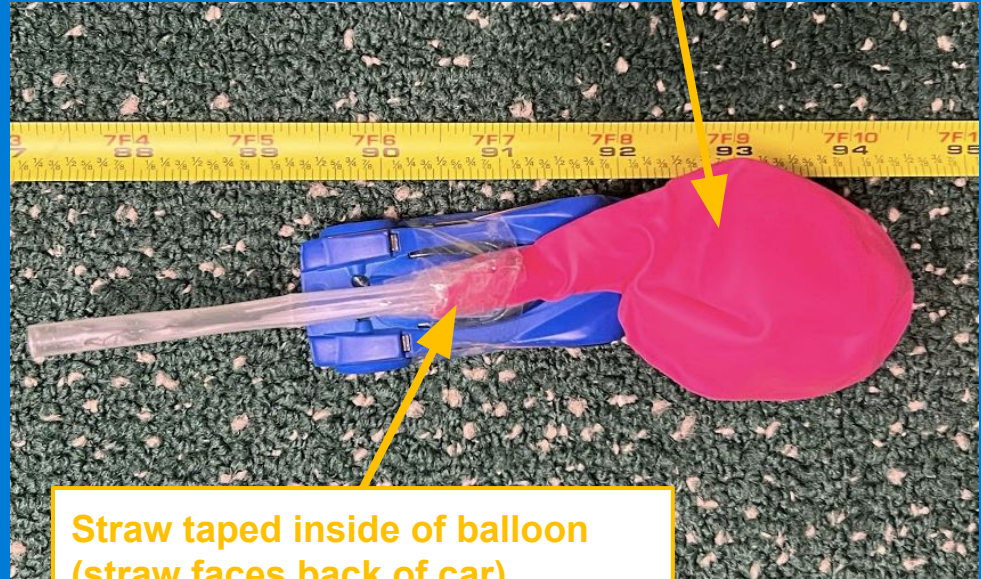
Stopwatch

Car with coins taped on top

# LESSON 5: ACTION AND REACTION

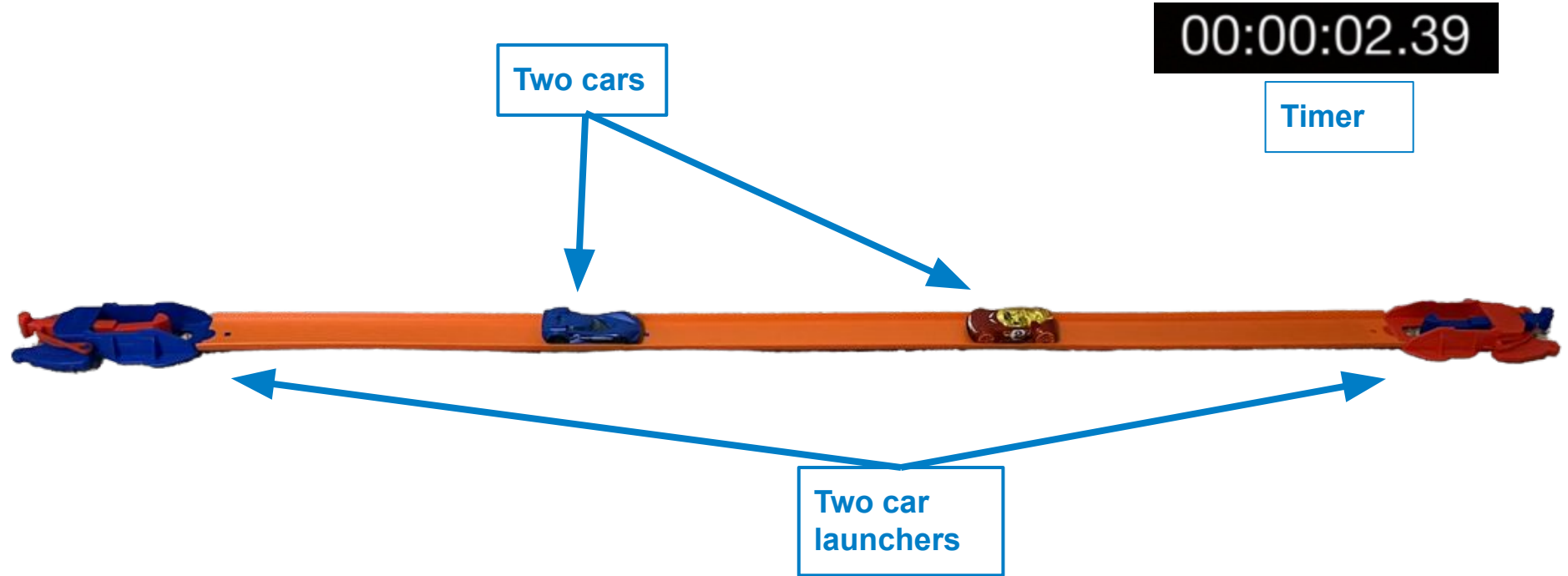


Balloon faces toward car

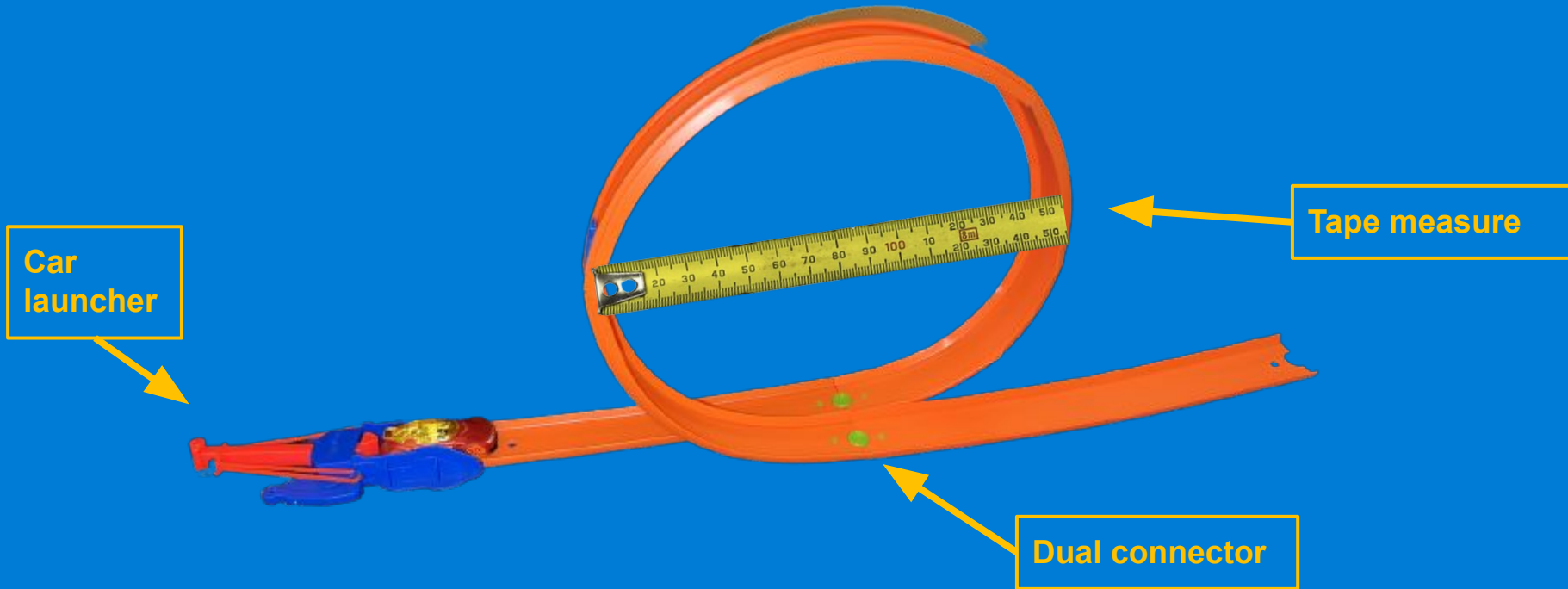


Straw taped inside of balloon  
(straw faces back of car)

# LESSON 6: MOMENTUM AND COLLISIONS



# LESSON 7: CENTRIPETAL FORCE



# For Best Results...

