

## 7.6 Investigate Elastic Drag Cars

### Aim

To build a self propelled rubber band car and test acceleration changes due to mass and force.

### Equipment

LEGO or similar materials to make an elastic car. (research images of elastic cars for designs)

Various rubber bands

Include space on car to add weights. (see some LEGO images of construction at end)

Measure a 3 metre track.

Stopwatch or datalogging motion sensor (accelerometer, distance sensor or lightgate)

### Testing Accelerations

#### 1. Small force and small mass

Build your elastic dragcar, by your own design or standard model. This should be light with a small rubber band.

Test its acceleration from a standing start over a 3 metre track by using a stopwatch or motion sensor. Record time or maximum speed for small force and small mass.

2. Increase the mass of the car by adding some weight. Keep the band tension the same. Test and record time for small force and large mass.
3. Increase the tension of the elastic band by using a stronger band or doubling the number of bands. Use the light car with no extra mass. Test and record time or speed for large force and small mass.
4. Combine large force and large mass by adding weight and using the stronger bands. Test and record time or speed for large force and large mass.

### Results

Test	force	mass	Average Time/ speed
1.	Small	small	
2.	Small	large	
3.	Large	small	
4.	Large	large	

### Conclusions

1. What combination makes the fastest dragcar?
2. How does increasing force effect acceleration?
3. How does increasing mass effect acceleration?

Some Example Lego elastic drag cars

