

## Parachutes

Grades 4+ | Students Served: 30

ELEMENTARY



### Essential Questions

What material would you want a parachute made of if it were attached to your back?

How does the mass attached to the parachute affect how fast the parachute falls?

How does the size of the parachute affect how fast the parachute falls?

### Career Connections:

- Skydiving Instructor
- Pilot
- Astronaut
- Civil Engineer

### STEM Connections

#### Science

- Aerodynamic drag
- Negative acceleration
- Observation and data

#### Technology

- Design processes
- Troubleshooting
- Historical perspectives

#### Engineering

- Problem solving
- Safety engineering
- Technological design

#### Math

- Circular area
- Radius
- Ratios
- Geometric shapes

## Sample Activity

### Free, Free Falling

#### Challenge

Students work in teams of two to construct the parachutes as specified. Various numbers of large paper clips are added as the load for the parachutes.

- One student drops his or her parachute from a specified height (dropping from the mezzanine of a gymnasium works well), while another student times the drop from the point of release to the load landing on the floor.
- Record the time for each number of paper clips. Also record any observations of parachute performance with various loads.
- Calculate average velocity by dividing the height of the drop by the time.

No. of Paper Clips	Height (m)	Time (sec)	Average Velocity (m/sec)
5			
10			
15			
20			
25			

#### Discussion

Judging by the graph, at what point will the parachute be of little use due to the mass of the paper clips? How would you construct another parachute to withstand more mass?

