

Introduction

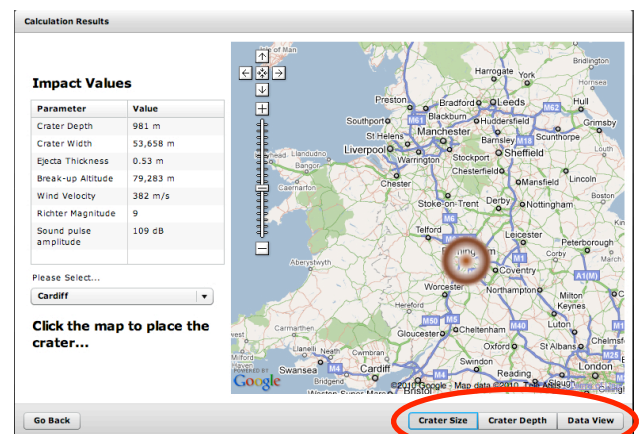
During this activity you will be simulating the effect of an impact on the Earth. You can change the physical character of both the impactor and type of ground that it hits and see what happens. The simulated results will be compared to existing Earth craters at various locations across the world.

Impact!

1. Go to the impact calculator at: http://education.down2earth.eu/impact_calculator
2. After selecting the language you want to use, click **'Start'**. You will be presented with a choice of 6 parameters you need to set before you can simulate an impact. These are:

- the size of the projectile
- the composition of the projectile
- the velocity of the projectile
- the angle at which the projectile hits the Earth
- the distance you are from the crash site
- the composition of the land.

3. Once you have chosen your parameters, click **'Submit'** and place your impact crater at various locations around the world.



4. Look at the effect of your impact by clicking on the **'Crater Depth'** and **'Data View'** buttons.

Bang!

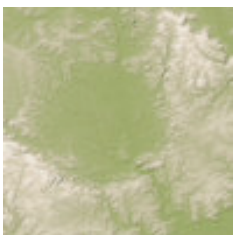
Now we are going to see if we can reproduce some of the real impact craters we see on Earth.

Use the data listed below to calculate the effects of each event. These values are estimates based on the real scientific investigations of these known impact craters on the Earth. **Set your distance from impact as 500km so that you are not destroyed by the larger impact events!**



Barringer Meteor Crater, USA

Projectile Diameter: 100 m
 Projectile Density: Iron (8000 kg/m³)
 Impact Velocity: 20 km/s
 Impact Angle: 45°
 Target Density: Sedimentary rock



Ries Crater, Germany

Projectile Diameter: 1500 m
 Projectile Density: dense rock (2700 kg/m³)
 Impact Velocity: 20 km/s
 Impact Angle: 30°
 Target Density: Sedimentary rock

Chesapeake Bay, USA



Projectile Diameter: 3500 m
 Projectile Density: dense rock (2700 kg/m³)
 Impact Velocity: 20 km/s
 Impact Angle: 45°
 Target Density: Sedimentary rock

Record your results in the table below:

| Crater Name | Impact Energy | Crater Depth | Crater Diameter | Other effects | Frequency of impact |
|----------------|---------------|--------------|-----------------|---------------|---------------------|
| Barringer | | | | | |
| Ries | | | | | |
| Chesapeake Bay | | | | | |

Snap!

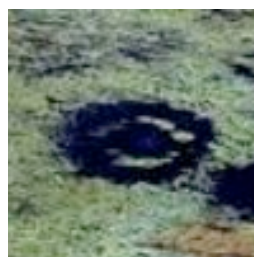
Below are 3 impact craters found on Earth. Using the impact calculator, can you fill in the gaps for the details of the impactor to match these craters? *Hint: There may be more than one way of forming each crater!*

| Crater Name | Projectile Diameter | Angle of trajectory | Object Velocity | Projectile Density | Target Density | Crater Diameter |
|---------------------------|---------------------|---------------------|-----------------|--------------------|------------------|-----------------|
| Tenoumer crater - Africa | | 45° | 20km/s | | Sedimentary rock | 1.8 km |
| Clearwater Lakes - Canada | | 45° | 20km/s | | | 30km |
| Chicxulub - Mexico | | | | | | 110km |

Tenoumer Crater



Clearwater Lakes



Chicxulub

