

Crash Test Dummy



Key knowledge

The 3 parts to the design process are design, make and evaluate.

The design brief explains why your product is needed: protect the egg on its journey down the ramp.

The egg will break if the impact forces are too great.

Research means gathering information: find out about safety features e.g. crumple zones and seat belts.

Crumple zones and seatbelts work by increasing the impact time and therefore reducing the impact force so it has less effect.

Seat belts also hold people in their seats to they stop moving when the vehicle stops.

Annotations are added to a design to add detail and descriptions.

Issues need to be solved and then added to annotations with explanations.

Designs can be improved and redesigned as needed.

Fair testing is where all the conditions stay the same and only the vehicle changes.

The vehicle is tested first at low speed then high speed. The speed is changed by altering the angle of the ramp.

Key Skills

Research—find 3 examples of features on vehicles that reduce impact forces. These may have different designs, features and materials and have already been produced.

Evaluate the features from your research. Decide which ones will help in the design and which ones are not useful. There may be good ideas that can be combined.

Draw and annotate a basic design that will protect the egg by increasing the impact time. Use the ideas from your research.

Annotate designs: sketch your design and label with features. Describe the features and then explain why you have added them and how they will work.

Explain how the safety features reduce impact forces. The features may have other uses e.g. seatbelts.

When using equipment follow the safety instructions given.

Tidy away all equipment to the correct place so that others can find it. Report any damage or wear and tear of equipment.

Put all scrap materials in the bin (or appropriate recycling container.)

Follow the testing routines to ensure testing is fair and gives reliable results.

Key vocabulary

Vehicle—a machine that transports people or cargo.

Force—an interaction which can change the speed, direction or shape of an object.

Impact—the action of one object coming forcibly into contact with another.

Impact forces—a high force applied over a short period of time. It usually has more effect than a lower force over a longer period of time.

Impact time—short time period when 2 bodies collide.

Crumple zone—a structural safety feature used in vehicles to increase the impact time and reduce the impact force. They work by controlled deforming (or crumpling) of the vehicle.

Seatbelt—a safety device designed to secure the driver or passenger of a vehicle against harmful movement as a result of a sudden stop.

Drag—a force acting opposite the motion of any object moving through a fluid (liquid or gas).

Friction—force between 2 surfaces that are sliding (or trying to slide) across each other.

Design—a plan or specification for the construction of an object or product.

Evaluate—to assess or determine the quality of a product against its specification.