



WORD CARD

STRUCTURE

What it means

A structure is something built to hold, support, or protect.

Example

A bridge, tower, and house are all structures.

★ TRY IT

Look around your home and name three structures.

Talk About It

What makes a structure useful?

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STABILITY

What it means

Stability means something stays in place and does not tip over easily.

Example

A wide base can help a tower stay stable.

★ TRY IT

Build one wide tower and one narrow tower. Which feels more stable?

Talk About It

Why do some things wobble more than others?

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BALANCE

What it means

Balance means weight is spread in a way that helps something stay steady.

Example

A bridge must balance the load it carries.

★ TRY IT

Put objects on both sides of a ruler and see how balance changes.

Talk About It

What happens when one side is heavier?

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MATERIAL

What it means

Materials are the things we use to build something.

Example

Paper, cardboard, tape, straws, and craft sticks are materials.

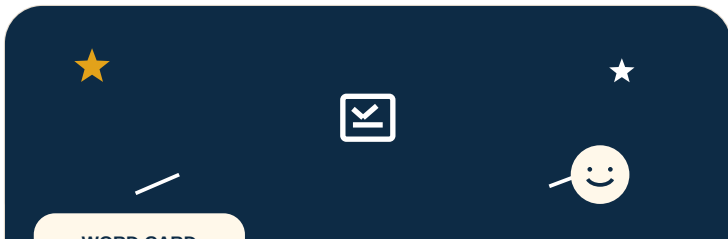
★ TRY IT

Compare two materials. Which bends more? Which feels stronger?

Talk About It

How might an engineer choose a material?

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TEST

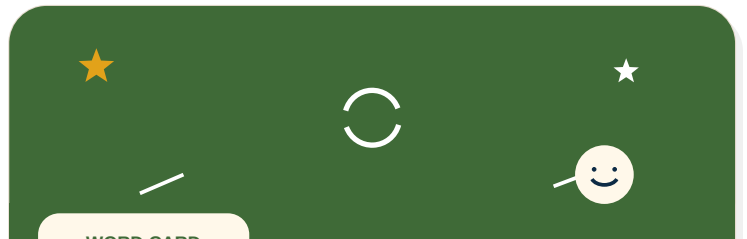
What it means
To test means to try something and see how well it works.

Example
You can test a bridge by adding coins to it.

★ **TRY IT**
Build something simple and test how much weight it can hold.

Talk About It
Why is testing important?

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REDESIGN

What it means
Redesign means changing a design to make it work better.

Example
If a bridge bends, you might add support and test again.

★ **TRY IT**
Build, test, change one part, and test again.

Talk About It
What did you improve?

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SUPPORT

What it means
A support is a part that helps hold something up.

Example
Columns under a bridge help support weight.

★ **TRY IT**
Add a folded-paper support under a paper bridge and test again.

Talk About It
How did the support help?

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STRONG SHAPE

What it means
Some shapes can hold weight better than others.

Example
Triangles are often used in strong structures.

★ **TRY IT**
Make a square and a triangle with craft sticks. Compare them.

Talk About It
Why do engineers use triangles?

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FAMILY CHALLENGE

PAPER BRIDGE

You need

Paper, tape, two books, coins or small objects

Let's do it!

- 1 Place two books a short distance apart.
- 2 Use paper to make a bridge between them.
- 3 Add coins one at a time.
- 4 Count how many your bridge can hold.

★ BONUS TRY

Fold the paper or add layers.

Talk About It

What helped your bridge become stronger?

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FAMILY CHALLENGE

STRONG SHAPE CHALLENGE

You need

Paper, tape, straws or craft sticks

Let's do it!

- 1 Make a square, triangle, tube, or another shape.
- 2 Test each shape gently or add weight.
- 3 Compare which shape stays strongest.

★ BONUS TRY

Combine two shapes together.

Talk About It

Which shape worked best, and why?

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FAMILY CHALLENGE

TOWER TEST

You need

Blocks, cups, cardboard, or recycled materials

Let's do it!

- 1 Build a tower as tall as you can.
- 2 Check whether it stands on its own.
- 3 Change one part to improve it.
- 4 Test again.

★ BONUS TRY

Build the tallest tower using fewer materials.

Talk About It

What made your tower more stable?

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FAMILY CHALLENGE

TOY CAR BRIDGE

You need

Paper, cardboard, tape, toy car

Let's do it!

- 1 Build a bridge wide enough for a toy car.
- 2 Roll the car across it.
- 3 Notice weak or bumpy places.
- 4 Fix them and try again.

★ BONUS TRY

Make the bridge longer or smoother.

Talk About It

What mattered most: strength, width, or smoothness?

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FAMILY CHALLENGE

SHAKE TEST

You need

Blocks, cups, straws, tray or flat cardboard

Let's do it!

- 1 Build a tower or structure.
- 2 Put it on a tray or flat cardboard.
- 3 Shake gently and notice what moves first.
- 4 Redesign and test again.

★ BONUS TRY

Compare gentle shaking and stronger shaking.

Talk About It

What helped your structure stay standing?

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FAMILY CHALLENGE

ENGINEER HUNT

You need

Your eyes, curiosity, and optionally a pencil or camera

Let's do it!

- 1 Walk around your home or neighborhood.
- 2 Look for bridges, supports, strong shapes, and materials.
- 3 Talk about why they may have been designed that way.

★ BONUS TRY

Draw or photograph one engineering idea you notice.

Talk About It

What engineering ideas do you see every day?

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— DESIGNED FOR FAMILIES —