

Projects and Crafts

Build, design, create, and grow with projects and crafts that use everyday materials like paper towel tubes and cardboard boxes.

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Want to get away? Build a hideout you can fit inside.



Use the materials to build a hideout that: Easy. Fits one person. Medium. Fits two people. Hard. Fits one person lying down. Levels: Easy, Medium, Hard

Group size: 1-3 per hideout

Materials per hideout:

40 or more cardboard tubes from paper towel rolls (or, make tubes from tightly rolled newspaper and tape)

scissors

tape

2 Give tours



B Hideout awards (optional)

Each hideout wins an award for size or shape. Everyone decides on awards together.

Variations

Hide out in a tent (Easy, Medium, Hard). Make your hideout strong enough so that you can cover it with a sheet or blanket.

Toy hideout (Medium, Hard). Use toothpicks and gumdrops to build a hideout for a toy animal or person. The hideout should have at least 4 square inches of floor space. For extra challenge, build a hideout that encloses at least 12 cubic inches of space.





Potato Bridge

Pile on the potatoes! Build a cardboard bridge that holds as many potatoes as possible.

Levels: Easy, Medium

Group size: 1-2 per bridge

Materials per bridge:

cardboard from two cereal boxes

scissors

tape

5 lb. bag of potatoes (can be shared for more than one bridge)

ruler (Medium)

Build, test, and revise

Use the materials to build a bridge that:

Easy. Holds as many potatoes as possible.

Medium. Holds as many potatoes as possible and is at least 8 inches high.



Talk About

How can you keep your bridge from collapsing when you add an extra potato?

2 Make it stronger

Try to build a bridge that holds even more potatoes. For extra challenge, use only one cereal box.

Bridge awards (optional)

Each bridge wins an award for size or strength. Everyone decides on awards together.

Variations

Use tubes (Easy). In addition to the cardboard from cereal boxes, use up to two paper towel tubes to make your bridge.

Gumdrop bridge (Easy, Medium). Build the strongest bridge you can with 50 gumdrops and 200 toothpicks. For extra challenge, make the bridge at least 10 inches long.



Ride on a Slide



Build a cardboard slide that takes three seconds to roll down.

Build, test, and revise

Use the materials to build a slide that takes your "slide rider" three seconds to roll down.

Your "slide rider" should stay on the slide the whole time. No falling off!



2 Show off your slide

Demonstrate the slide for someone else.

Slide awards (optional)

Each slide wins an award for speed or slope. Everyone decides on awards together.

Variations

Use tubes (Medium). In addition to the cardboard, use up to two paper towel tubes to make your slide.

Make it steep and scary (Hard). Start your slide at least 18 inches from the ground.

Slide uphill (Hard). Build your slide so that the "slide rider" goes uphill for part of the ride.

Levels: Medium (Hard)

Group size: 1-3 per slide

Materials per slide:

2 boxes (cereal or shoe box size), taken apart so they remain in one piece



a "slide rider" (paper tube or toy car)

scissors

tape

watch or timer that shows seconds

telephone books, block, or boxes for elevating part of the slide (optional)





Make your own counting book and share it with someone else.

Levels: Easy, Medium, Hard

Group size: at least one person to make a book and one to hear the story

Materials per book:

several sheets of paper (optional: fold and staple to make a book)

markers, stickers, and other art supplies

Decide how you'll count and how high you'll go

Easy. Count up by 1, 2 or 1¢. Start at 0. Or, count back and start at 10 (or 10¢).

Medium. Count up by 4, 5, 10, or 10¢. Start at 0. Or, count back from 50 or 100.

Hard. Count up or back by 25¢, 1/2, 3/2, 7, or 11. Start anywhere.

Plan your story

Talk About

What happens in the story? What increases (or decreases) on each page?



8 Put it on paper

Write your story, or plan it out so you can tell it as you show the pages. Each page of the book should include a number and a picture to match.

Talk

About What number will be on the next page? What about on the page after that? Why do you think so?

4 Read or tell your story

Variation

Square stories (Hard). Write a counting book based on square numbers: $1 (1 \times 1); 4 (2 \times 2); 9 (3 \times 3).$



Make a mystery cup. Fill it up, and challenge others to find out how many are inside.

Count and fill

Count out objects to fill a cup. Keep the total a secret!



2 Cover the cup with plastic wrap

Secure the wrap with a rubber band.

B Trade cups

Estimate how many are inside. Count to check.

Levels: Easy, Medium

Group size: 2 or more (to make and trade cups)

Materials (per cup):

clear plastic cup

rubber band

sheet of plastic wrap

objects for filling cups

Easy. large objects (e.g., big pieces of pasta) so 10-20 fill the cup

Medium. smaller objects (e.g., beads) so 20-50 fill the cup



Variation

Mystery snack (Easy, Medium). Make a mystery cup filled with dried fruit or another food. Everyone estimates and counts before eating.



How do you estimate? Use what you know about one cup to find how many in the other.

Level: Hard

Group size: 2 or more (to make and trade cups)

Materials (per two cups):

two clear plastic cups the same size

two rubber bands

two sheets of plastic wrap

objects that come in two sizes (pompoms, pasta shells): larger so that about 20-40 fill the cup, and smaller so that at least 100 fill the cup

Make two mystery cups

Follow steps 1 and 2 from Estimation Station. Put the larger objects in Cup 1 and the smaller in Cup 2.



😢 Trade cups

Say how many are in Cup 1. The other person estimates how many are in Cup 2.



Growing Plants



How fast does your garden grow? Grow plants and track how they grow over time.

Before beginning

Plant seeds or seedlings.

Predict

Talk

About How tall will your plant be in a week? How tall in a month?

2 Measure each week

Easy. Cut straws to the height of the plant. Tape the straws to graph paper.





Medium. Measure with a ruler and mark the height on graph paper.

B What do you notice?

Talk About

Does your plant grow about the same amount each week? How can you tell?

How does the actual plant growth compare with your predictions?

Variation

Change the conditions (Medium). Put one plant in the sun and one in the shade. Do both grow about the same amount each week?

Levels: Easy, Medium

Group size: 1-2 per plant

Materials per plant:

seeds or seedlings that grow quickly (e.g., grass, beans, avocado pit) potting soil and a pot a few straws scissors tape marker piece of graph paper ruler (Medium)



If an eraser were ten times its size, could you hide behind it? Make one to find out!

Levels: Medium, Hard

Group size: 1-2 per giant object

Materials per giant object:

large sheet of graph or plain paper (or, tape a few sheets together to make a big piece)

flat, rectangular object such as a dollar or eraser

pencil, marker, scissors

ruler or yardstick (Hard)

Could you hide behind a giant one?

Pick a flat, rectangular object such as an eraser or a dollar.

Imagine that is ten times longer and ten times wider. Then predict:

- Would it cover your hand?
- Would it cover your face?
- Could you hide behind it?

2 Make a giant one

Medium. Trace your object ten times across and ten times down.

Hard. Measure your object, multiply length and width by ten, and draw the giant one on graph paper.



Cut out and decorate your giant object.



6 Compare predictions and results

Variation

Could you fit inside it? (Hard). Pick a three-dimensional object such as a cup or juice box. Predict: Could you fit inside it if it were ten times wider, longer, and higher? Make one and see!



Save your spare change for a special purchase or donation.

Before beginning

Choose something to save up for.

Medium. Choose something that costs up to \$10. Hard. Choose something that costs up to \$100.

Predict

Talk

How long do you think it will take About for us to reach our goal? How full will the jar be when we reach the goal?

Write down your predictions and today's date.

Collect and count



Put spare change in the jar every day.

Count the change every week and write down the amount.

Compare your predictions with your progress so far.

Keep counting and collecting until you reach the goal.

Variations

Make tens (Easy). Sort coins by type. Then, put them in piles of ten. An older child or adult helps find the total.

How long to fill the jar? (Medium, Hard). Predict how long it will take to fill the jar with spare change. Then, try it and count up how much you have when the jar is full.

Levels: Medium, Hard (Easy)

Group size: small enough so everyone gets a chance to count coins

Materials:

clear jar for coins paper and pencils calculator (optional)





Puzzle Me This

Stump your friends with a puzzle you design.

Levels: Hard (Medium)

Group size: 2 or more (to make and trade puzzles)

Materials per puzzle:

piece of graph paper

scissors

pencil

envelope

colored pencils (optional)

thick cardboard or foam for puzzle backing; glue (optional)

Make the puzzle grid

Block off 12 grid squares across and 12 down. Cut out the 12×12 square.



Plan the pieces

Plan how you will divide the 12 × 12 square into six pieces. Each piece should be made from the same number of squares but have a different shape.

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Draw the outline of the pieces on the 12×12 square.

Color in the pieces (optional).

Glue the puzzle onto a cardboard or foam backing (optional).

🚯 Cut

Put the six pieces in an envelope.

4 Trade puzzles

Talk About

Can you find more than one way to assemble the pieces into a 12×12 square?

(continued on next page)



Variations

Two shapes (Medium). Divide the 12×12 square into six pieces: three of one shape and three of another.

Double trouble (Hard). Make and trade 12 piece puzzles. Divide the six pieces in half to make 12 pieces.

Different size pieces (Hard). Block off 16 squares across and 16 down. The largest piece should use half the squares in the grid, the next largest should use half of that, the next-largest is half of that, and so on.

