

# Learning *at Home*

## Ideas for STEM

There are so many ways to spark children's interest and learning in STEM. With these unique, open-ended activities using household materials, children (and adults) can begin to think like engineers, architects, designers, and more. Check out these preschool and school-age STEM Provocations for experiences designed to promote exploration, discovery, and problem solving. Note that these suggestions will give you a place to start and can lead in many directions based on children's interests. For Bright Horizons activities and resources, visit <https://www.brighthorizons.com/family-resources>.

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## Preschool Activity Starters

### Think Like an Engineer: Moving Balls

**Ages:** 4+

**STEM Material Suggestions:** wooden blocks, ramp materials (wooden planks, pvc or rubber ramps), small balls, tape, other building materials of your choice, paper for sketching/writing, writing utensils

- ▶ **ASK:** Can you create something that moves a ball from one place to another?
  - ▶ **IMAGINE:** What would that look like? What materials would you use?
  - ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
  - ▶ **CREATE:** Build it!
  - ▶ **IMPROVE:** What worked? What didn't? What would you try next?
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### Think Like an Architect: Pyramid Challenge

**Ages:** 4+

**STEM Material Suggestions:** toothpicks and modeling clay or playdough, cotton swabs and glue, paper for sketching/writing, writing utensils

- ▶ **ASK:** How can you build the largest pyramid possible?
- ▶ **IMAGINE:** What would that look like? What do you need to know about pyramids?
- ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
- ▶ **CREATE:** Build it!
- ▶ **IMPROVE:** What worked? What didn't? What would you try next?



## Think Like a Designer: Wearable Art

**Ages:** 5+

**STEM Material Suggestions:** loose parts and collage materials: beads, gems, chenille stems, glue, yarn or beading string, fabric swatches, rubber bands, cardboard, paper for sketching/writing, writing utensils

- ▶ **ASK:** Can you design something that you can wear?
  - ▶ **IMAGINE:** What are some things people wear? What do you like to wear?
  - ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
  - ▶ **CREATE:** Create it!
  - ▶ **IMPROVE:** What worked? What didn't? What would you try next?
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## Think Like an Engineer: Up, Up and Away!

**Ages** 6+

**STEM Material Suggestions:** small dolls/action figures (such as Duplo figures), blocks, wood planks, cardboard, boxes, wooden sticks, construction paper, tape, paper tubes, paper for sketching/writing, writing utensils

- ▶ **ASK:** How can you make a figure fly without touching or throwing it?
  - ▶ **IMAGINE:** What kinds of machines could make your figure fly? What resources can you use to find out more?
  - ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
  - ▶ **CREATE:** Build your machine and try it out.
  - ▶ **IMPROVE:** What worked? What didn't? How can you make your figure fly higher or farther?
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## Think Like an Engineer: Things that Go!

**Ages** 5+

**STEM Material Suggestions:** building bricks (such as Legos), recyclable materials (small boxes, paper tubes, paper) glue, tape, crayons/markers, paper for sketching/writing, writing utensils

- ▶ **ASK:** Can you build a vehicle for someone in your family?
- ▶ **IMAGINE:** What do you know about vehicles? Who are you creating a vehicle for? What type of vehicle do they need?
- ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
- ▶ **CREATE:** Build It! Try it out. Share your vehicle with the person you created it for.
- ▶ **IMPROVE:** Did your vehicle turn out how you thought it would? What worked? What didn't? What would you try next?



## Think Like an Engineer: Magnet Wand

**Ages:** 4+

**STEM Material Suggestions:** small household magnet, paper tube, stick or wooden dowel, tape/ glue, markers/crayons, paper for sketching/writing, writing utensils

**ASK:** How can you create a magnet wand to test materials around the house?

**IMAGINE:** What would that look like? What materials would you use?

**PLAN:** Brainstorm, draw, sketch, write down your ideas.

**CREATE:** Build it! Try out your wand on materials around the house. What is the magnet attracted to? Were there any surprises?

**IMPROVE:** What worked? What didn't? What would you try next?

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## Think Like a Scientist: Walking Water Drops

**Ages:** 4+

**STEM Material Suggestions:** eyedroppers, basters or drinking straws, food coloring, containers for water, flat surface such as plastic cutting mat or baking pan, towels to wipe up spills, paper for sketching/writing, writing utensils

- ▶ **ASK:** How can you make water droplets move?
  - ▶ **IMAGINE:** What happens when you drop water droplets onto the flat surface? If you move the flat surface what happens? How can you make the water drops move without using your hands?
  - ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
  - ▶ **CREATE:** Try it! Use different materials to try to make the water droplets move.
  - ▶ **IMPROVE:** What worked? What didn't? What would you try next?
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## Think Like an Engineer: Race Car Ramp

**Ages:** 4+

**STEM Material Suggestions:** small cars or vehicles, blocks, wooden planks, tape, paper tubes, paper for sketching/writing, writing utensils, measuring tape

- ▶ **ASK:** What is the highest or longest ramp you can build for a car?
- ▶ **IMAGINE:** What would that look like? What materials would you use?
- ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
- ▶ **CREATE:** Build it! Try out your ramp and measure how far your car travels.
- ▶ **IMPROVE:** What worked? What can you do to make your car travel farther? Can you make your ramp higher? What will you try next?



# School-Age Activity Starters

## Think Like a Designer: Tube Toys

**Ages:** 6+

**STEM Material Suggestions:** paper tubes, fabric swatches, collage materials, small hardware (screws, bolts, washers), crayons/markers, yarn, tape, glue, craft paper, paper for sketching/writing, writing utensils

- ▶ **ASK:** Can you design a toy from paper tubes?
  - ▶ **IMAGINE:** What are some different types of toys? What do you like to play with?
  - ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
  - ▶ **CREATE:** Create it! Try playing with your toy?
  - ▶ **IMPROVE:** Did your toy turn out like you thought? What do you like best about it? What would you try next if making this again?
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## Think Like an Architect: Tinfoil Tower

**Ages:** 6+

**STEM Material Suggestions:** aluminum/tinfoil sheets or roll, paper for sketching/writing, writing utensils

**ASK:** What is the tallest tower you can create using only tinfoil?

**IMAGINE:** What would that look like? What do you need to know about towers?

**PLAN:** Brainstorm, draw, sketch, write down your ideas.

**CREATE:** Make a prediction. How tall do you think it will be? Build it!

**IMPROVE:** What worked well? What was hard to? What would you try next?

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## Think Like a Designer: Paper Chair for a Bear

**Ages:** 6+

**STEM Material Suggestions:** tape, craft paper, writing utensils

- ▶ **ASK:** Can you design a chair using only paper and tape that can hold a stuffed animal?
- ▶ **IMAGINE:** What type of chair will you create? What stuffed animal will it be for?
- ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
- ▶ **CREATE:** Create it! Build your chair and test to see if it will hold your stuffed animal.
- ▶ **IMPROVE:** Did your chair turn out like you thought? What was the most challenging part of creating it? What would you try next if making this again?



## Think Like a Designer: Bird Nest Challenge

**Ages:** 6+

**STEM Material Suggestions:** yarn, rope, chenille stems, paper, glue, tape, collage materials, fabric swatches, paper, writing utensils, 2-3 eggs/small balls, paper for sketching/writing, writing utensils

- ▶ **ASK:** Can you design a bird nest that will hold 2-3 eggs/small balls
  - ▶ **IMAGINE:** What do you know about bird nests? What resources can you use to find out more?
  - ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
  - ▶ **CREATE:** Create it! Build your nest and test to see if it will hold your “eggs”.
  - ▶ **IMPROVE:** What worked well? What could you improve/change so that it could hold more eggs?
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## Think Like an Engineer: Tinkering with Tubes

**Ages:** 6+

**STEM Material Suggestions:** paper tubes cut into various sizes, drinking straws cut in 2 sizes, paper for sketching/writing, writing utensils, hole puncher, scissors (note: ahead of time, use hole puncher to make holes along the edges of the tubes to enable them to be connected with the straws)

- ▶ **ASK:** What can you build with paper tubes and straws?
  - ▶ **IMAGINE:** What do you want your structure to look like? What could it be used for?
  - ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
  - ▶ **CREATE:** Build it! Use the straws and tubes to construct based on your plan.
  - ▶ **IMPROVE:** What worked? What will you try next?
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## Think Like an Engineer: Mini Marble Maze

**Ages:** 6+

**STEM Material Suggestions:** building bricks and base, small ball/marbles, paper for sketching/writing, writing utensils

- ▶ **ASK:** Can you create a marble maze using building bricks?
- ▶ **IMAGINE:** What do you want your maze to look like? What do you know about mazes?
- ▶ **PLAN:** Brainstorm, draw, sketch, write down your ideas.
- ▶ **CREATE:** Build it! Use the base and bricks to create your maze. Try it out with the ball/marble
- ▶ **IMPROVE:** What worked? What will you try next? How can you expand this maze? Who else can try out your maze?

