

Design Challenge: Baby Bear's Chair

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Goldilocks and The Three Bears</u> / Troll Associates Other suggested titles include: <u>A Chair For Baby Bear</u> / Kaye Umansky <u>A Chair for My Mother</u> / Vera B. Williams <u>Peter's Chair</u> / Ezra Jack Keats	glue guns rulers box cutters	white glue craft sticks masking tape paper fasteners paper clips	paper towel rolls toilet paper rolls small or med boxes 100g weights

The Design Challenge

Making: Build a chair that stands on its own.

Engineering: Build a stable chair that doesn't wobble and can hold an object that weighs at least 100g.

Design Challenge: Crazy Catapults Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Olympig!</u> / Victoria Jamieson	glue guns rulers box cutters wire cutters protractor	white glue masking tape wire string elastics binder clips	wood bottle caps craft sticks tongue depressors plastic spoons clothespins twist ties pom-poms cottonballs packing peanuts dowelling
<u>Explore Simple Machines! With 25 Great Projects!</u> /Anita Yasuda			
<u>The Knight and the Dragon</u> /Tomie dePaola			
<u>Simon and Catapult Man's Perilous Playground Adventure</u> /Norne Smiley			
<u>Break the Siege: Make Your Own Catapults</u> /Rob Ives			

The Design Challenge

Making: Use a spoon as a catapult to launch a pom-pom or other lightweight object.

Engineering: Design and build a catapult that will launch a soft, lightweight object at least five feet.

Design Challenge: Wind Wonders Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>The Wind Blew</u> / Pat Hutchins	glue guns rulers box cutters wire cutters protractor	tape glue pipe cleaners string construction paper pom poms straws egg timers	plastic cups paper towel rolls cardboard wood scraps wooden spools corks table tennis balls other lightweight materials to blow around
<u>Windblown</u> /Edouard Manceau			
<u>Wind Power: 20 Projects to Make with Paper</u> /Clive Dobson			
<u>I Face the Wind</u> /Vicki Cobb			
<u>Flora's Very Windy Day</u> /Jeanne Birdsall			
<u>Harnessing Wind Energy</u> /Nancy Dickman			
<u>The Boy Who Harnessed the Wind</u> /William Kamkwamba (a novel)			

The Design Challenge

Making: Use a drinking straw to blow a table tennis ball from one place to another.

Engineering: Construct a maze by taping obstacles on a tabletop. Blow air through a straw to move a table tennis ball through the maze.

Design Challenge: A House For the Three Little Pigs

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<p><u>The Three Little Pigs/</u> *available at DRC = Big Book format</p>	<p>glue guns rulers box cutters wire wire cutters tongs tweezers</p>	<p>white glue staplers and staples craft sticks modelling clay masking tape paper fasteners paper clips straws</p>	<p>paper towel rolls toilet paper rolls newspapers sticks toothpicks paper cups</p>
<p>Other title suggestions include: <u>The Three Horrid Little Pigs/</u> Liz Pichon <u>the Three Little Pigs: An Architectural Tale/</u>Steven Guarnaccia <u>The True Story of the 3 Little Pigs!/</u> Jon Scieszka* *available at DRC</p>			<p>hair dryer</p>

The Design Challenge

Making: Select materials to build a house.

Design Challenge: A Sturdy Nest

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Mama Built a Little Nest</u> / Jennifer Ward	glue guns pliers	white glue shredded paper string pipe cleaners bird nest plastic eggs (beads) **plush birds from Squirrel-Proof Birdfeeder kit**	yarn toothpicks twigs branches mud
Other suggested titles include: <u>Are You My Mother?</u> / P.D. Eastman <u>The Best Nest</u> / P.D. Eastman <u>Have You Heard the Nesting Bird?</u> / Rita Gray			

The Design Challenge

Making: Build a strong bird nest.

Engineering: Build a strong nest that will hold the most weight possible. It must be strong enough to hold three plastic eggs and a toy bird. **Challenge:** It must sit on a branch without falling while holding the eggs and the toy bird.

Design Challenge Beautiful Buildings Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Iggy Peck Architect</u> / Andrea Beaty	glue guns rulers pliers wire cutters wire	craft sticks pipe cleaners straws masking tape binder clips elastics playdough	paper towel rolls toilet paper rolls small or med boxes toothpicks paper plates plastic cups wooden skewers rolling pins pennies
<u>First Shapes in Buildings</u> /Penny Ann Lane			
<u>Dreaming Up: A Celebration of Building</u> /Christy Hale			
<u>Building a House</u> /Byron Barton			
<u>How a House is Built</u> /Gail Gibbons			
<u>Look at That Building! A First Book of Structures</u> /Scot Ritchie <u>Building Structures and Towers</u> /Young Engineers: Tammy Enz			

The Design Challenge

Making: Create a tall building using several different materials.

Engineering: Use the materials to create a prototype (model) of a building you see in a photo or picture. Make your model at least two feet tall and sturdy enough to hold the weight of 100 pennies.

Design Challenge: Box It! Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>A Pig, A Fox, and a Box</u> / Jonathan Fenske	glue guns rulers box cutters pliers wire wire cutters	white glue masking tape construction paper tissue paper decorating items stickers string felt straws pom poms feathers googly eyes	cardboard boxes yarn fabric craft foam bottle caps cardstock paper plates cups twist ties wooden skewers beads
<u>Do Not Open!</u> /Joan Holub			
<u>Star Jumper: Journal of a Cardboard Genius</u> /Frank Asch			
<u>BOX! Castles, Kitchens & Other Cardboard Creations for Kids</u> /Noel MacNeal			
<u>All My Treasures: A Book of Joy</u> /Jo Witek			
<u>The Nowhere Box</u> /Sam Zupparidi			
<u>Mr. Cornell's Dream</u>			
<u>Boxes</u> /Jeanette Winter			
<u>The Box</u> /Axel Janssens			
<u>Sitting In My Box</u> /Dee Lillegard			
<u>A Box Story</u> /Kenneth Kit Lamug			
<u>Box: What Would You Do With a Box?</u> /Min Flyte			
<u>Not a Box</u> /Antoinette Portis			
<u>What to do With a Box</u> /Jane Yolan & Chris Sheban			
<u>Out of the Box</u> /Jemma Westing			
<u>The Cardboard Box Book</u> /Sarah Powell			

Design Challenge: Bug City Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>No Buzz for the Bees</u> / Jill Eggleton <u>Birds and Bugs</u> /Sharon Coan <u>Ultimate Bugopedia</u> /National Geographic Kids <u>Bugs: Explore the Amazing World of Bugs</u> /mini encyclopedia <u>The Bug Book</u> /Sue Fliess <u>The Best Book of Bugs</u> /Claire Llewellyn <u>The Very Busy Spider</u> /Eric Carle <u>Roberto The Insect Architect</u> /Nina Laden 2 – Bunch O' Bugs plastic bugs tubes	glue guns rulers box cutters pliers wire cutters 50 g weights	white glue stapler staples masking tape wire binder clips twine hole punchers	cardboard tubes (paper towel & toilet paper rolls) cardboard food containers milk cartons egg cartons yogurt cups foam trays clothespins toothpicks aluminum foil graph paper

The Design Challenge

Making: Build a home for an insect.

Design Challenge: Build a Bridge

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>The Three Billy Goats Gruff/</u> Paul Galdone	glue guns rulers box cutters wire wire cutters	white glue paper straws craft sticks paper clips paper fasteners masking tape modelling clay	newspapers cardboard Styrofoam trays small or med boxes toothpicks plastic cups cotton swabs 100 g weights bridge photos
Other title suggestions include: <u>Pop's Bridge/</u> Eve Bunting <u>This Bridge Will Not be Gray/</u> Dave Eggers <u>Twenty-One Elephants and Still</u> <u>Standing/</u> April Jones Prince			

The Design Challenge

Making: Build a troll-proof bridge that stands on its own so the goats can cross the river.

Engineering: Build a troll-proof bridge that spans at least 10 inches and supports at least 100g. Bridges can be attached to cardboard for a base.

Design Challenge: Float Your Boat

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Who Sank The Boat?</u> / Pamela Allen	rulers box cutters		aluminum foil pennies small plastic animals larger plastic animals 100 g weights small bins for water
Other title suggestions include: <u>The Gingerbread Boy</u> / Paul Galdone <u>Mr. Grumpy's Outing</u> / John Burningham <u>Toy Boat</u> / Randall de Seve <u>Float</u> / Daniel Miyares* *can be found in the Paper Airplanes Design challenge kit			

The Design Challenge

Making: Use foil to build a boat that floats.

Design Challenge: Gizmos Galore

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Rosie Revere, Engineer/</u> Andrea Beaty available at DRC	glue guns rulers box cutters wire wire cutters hammers screwdrivers pliers	white glue craft sticks masking tape	paper towel rolls toilet paper rolls small or med boxes fabric scraps yarn corks
Other title suggestions include: <u>Papa's Mechanical Fish/</u> Candace Fleming <u>Violet the Pilot/</u> Steve Breen <u>What Do You Do With An</u> <u>Idea? /</u> Kobi Yamada* *available at DRC			

The Design Challenge

Making: Take an everyday object and find ways to make it better.

Engineering: Find a way to improve an everyday object by making it lighter, smaller, more powerful, or able to be used for more than one purpose.

Design Challenge: Help! It's Stuck!

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>STUCK/</u> Oliver Jeffers <u>Tikki Tikki Tembo/</u> Arlene Mosel	glue guns rulers box cutters wire wire cutters tongs tweezers	white glue staplers and staples craft sticks modelling clay masking tape duct tape pipe cleaners paper fasteners paper clips string	paper towel rolls toilet paper rolls newspapers sticks spools clothespins Velcro 3 slinkys
Other title suggestions include: <u>Bubble Gum, Bubble Gum/</u> Lisa Wheeler <u>My Truck is Stuck!/</u> Kevin Lewis			

The Design Challenge

Making: Design and make a contraption or machine to retrieve an object without you touching the object.

Engineering: Design a contraption or machine to retrieve an object that is suspended at least two feet overhead.

Design Challenge: If The Shoe Fits

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<p><u>The Elves and the Shoemaker</u> / Jim LaMarche</p>	<p>glue guns rulers box cutters</p>	<p>white glue construction paper string felt foam masking tape pom-poms</p>	<p>cardboard from boxes yarn fabric cardstock plastic wrap bubble wrap Velcro darning needles mesh plastic canvas old shoes cut lengthwise buttons embroidery floss</p>
<p>Other suggested titles include:</p> <p><u>Pete the Cat: I Love My White Shoes</u> / Eric Litwin</p> <p><u>Shoes For Me!</u> / Sue Fliess</p> <p><u>Shoes, Shoes, Shoes</u> / Ann Morris</p>			

Design Challenge: Juice It!

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Caterina and the Lemonade Stand</u> / Erin Eitter Kono Other suggested titles include: <u>Lemonade for Sale</u> / Stuart J. Murphy <u>Lemonade in Winter: A Book About</u> <u>Two Kids Counting Money</u> / Emily Jenkins <u>Once Upon a Company...:A True Story</u> / Wendy Anderson Halperin	2 sieves blender hand juicer	straws	plastic bottles plastic cups tongue depressors baggies plastic knives plastic spoons fruits for juicing

The Design Challenge

Making: Create a fruit-flavoured drink that is unique, tasty, and has a catchy name.

Engineering: Invent a new tool for juicing and name it.

Design Challenge: Move Like An Animal

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Fraidyzoo</u> / Thyra Heder Other suggested titles include: <u>Put Me in the Zoo</u> / Robert Lopshire <u>A Sick Day for Amos McGee</u> / Philp C. Stead <u>What If You Had...!?</u> {series}/ Sandra Markle	glue guns rulers box cutters	construction paper staples staplers paintbrushes craft sticks masking tape paper fasteners felt googly eyes pipe cleaners pom-poms	toilet paper rolls paper towel rolls small or med boxes fabric thread yarn wooden skewers Velcro mesh plastic canvas buttons embroidery floss

The Design Challenge

Making: Create a zoo animal mask or costume.

Engineering: Create your own animal costume that looks like that animal and lets you move like it.

Design Challenge: Paper Airplanes Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>The Great Paper Caper</u> / Oliver Jeffers	stapler markers crayons pencils	paper clips brads masking tape	newspapers magazines pages
<u>Float</u> /Daniel Miyares			
<u>Whoosh: Easy Paper Airplanes for Kids</u> /Amy Naylor			
<u>Building Vehicles that Fly</u> /Tammy Enz			
<u>Kids' Paper Air Plane Book</u> /Ken Blackburn & Jeff Lammers			
<u>Airplanes</u> /Just Pictures			

The Design Challenge

Making: Fold a simple paper airplane and see how far it will fly.

Engineering: Make a complex paper airplane that flies as far as possible and can fly when you add a weight to it.

Design Challenge: Pet Carrier Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Before You Were Mine</u> / Maribeth Boelts	glue guns rulers box cutters wire cutters stapler scissors measuring tapes markers crayons pencils	white glue masking tape wire string elastics binder clips paper brads string pipe cleaners scale	paper towel rolls toilet paper rolls boxes fabric newspaper fabric
<u>A Home for Dixie</u> /Emma Jackson			
<u>A Home for Dakota</u> /Jan Zita Grover			
<u>Yoda: The Story of a Cat and his Kittens</u> /Beth Stern			
<u>How I Care for My Pet</u> /Jennifer Boothroyd			
<u>Pets Are Fun</u> /Chris George			
<u>We Play With Pets</u> /Leonard Atlantic			
<u>Guinea Pigs Galore</u> /Info Tales Scholastic			

Kit Contains:

100 gram weight

Stuffed Animals (11 count):

- small sitting stuffed orange tabby cat
- realistic stuffed gray cat 8 inch plush tabby cat
- small sitting stuffed back and white cat
- golden the stuffed golden retriever plush mini flopsie dog
- blackie the stuffed black lab mini flopsie dog

Design Challenge: Repurpose It!

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>The Most Magnificent Thing</u> / Ashley Spires* *available at the DRC	glue guns rulers box cutters wire wire cutters hammers pliers screwdrivers safety goggles	staples staplers white glue string modelling clay masking tape magnets	toilet paper rolls paper towel rolls small or med boxes ice cube trays paper plates plastic cups wooden skewers plastic mirrors corks spools funnels balls marbles clothespins velcro
Other suggested titles include: <u>Awesome Dawson</u> / Chris Gall <u>The Branch</u> / Mireille Messier <u>Choose to Reuse</u> / Lisa Bullard			

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Design Challenge: Roller Coaster Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
2X - <u>Curious George Roller Coaster</u> / Monica Perez	glue guns rulers box cutters wire wire cutters	white glue masking tape wire pipe cleaners stop watch	paper towel & toilet paper rolls or pool noodles (optional) balls marbles
<u>Harriet and the Roller Coaster</u> /Nancy Carlson			
<u>Roller Coasters: Extraordinary Engineering</u> /21 st Century Junior Library			
<u>Roller Coaster</u> /Marla Frazee			
<u>The Roller Coaster Kid</u> /Mary Ann Rodman <u>Roller Coasters</u> /Ladders National Geographic			

The Design Challenge

Making: Design a marble run by setting up cardboard tubes in different ways to make the marbles roll at different speeds.

Engineering: Using pool noodles or cardboard tubes, marbles, and other materials, set up a roller coaster that includes a series of tricks, like turns, loops and twists.

Design Challenge: Strike Up the Band Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Olivia Forms a Band</u> / Ian Falconer	glue guns rulers box cutters	white glue paint paint brushes stickers playdough string elastics pipe cleaners feathers pom poms glitter	paper towel & toilet paper rolls boxes tin cans yogurt containers with lids paper plates plastic cups chopsticks ribbon beads plastic eggs rice popcorn tinfoil musical instruments
<u>Musical Instruments</u> /Discovery Series			
<u>Making Musical Instruments with Kids</u> /Bart Hopkin			
<u>Tito Puente: Mambo King</u> /Rey del Mambo			
<u>Ah, Music!</u> /Alike			
<u>Never Play Music Right Next to the Zoo</u> /John Lithgow			
<u>Max Found Two Sticks</u> /Brian Pinkney			

Design Challenge: Trouble with Bubbles Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Bubble Trouble</u> / Margaret Mahy		pipe cleaners straws string masking tape	paper cups beads eye droppers bubble solution containers trays or buckets fan
<u>POP! A Book About Bubbles</u> /Kimberly Brubaker Bradley			
<u>Benny's Big Bubble</u> /Jane O'Connor			
<u>Bubble Homes and Fish Farts</u> /Fiona Bayrock			
<u>The Bubble Factory</u> /Tomie dePaola			

The Design Challenge

Making: Make a bubble wand any way you choose.

Engineering: Make bubble wands that are 3-D geometric shapes, like pyramids, cubes, rectangular prisms or cylinders.

Design Challenge: What A Car!

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>If I Built A Car</u> / Chris Van Dusen* *available at DRC	glue guns rulers screwdrivers hammers box cutters	paintbrushes paint white glue elastics straws craft sticks masking tape pom-poms googly eyes paper clips paper fasteners	toy cars wooden wheels screws balloons paper towel rolls toilet paper rolls small or med boxes plastic bottles bottle caps/lids
Other suggested titles include: <u>Cars: Rushing! Honking! Zooming!</u> / Patricia Hubell <u>My Little Car</u> / Gary Soto <u>Otto: The Boy Who Loved Cars</u> / Kara LaReau			

The Design Challenge

Making: Build a car that can do something special.

Engineering: Build a car that has one or more special features and can travel a distance of three inches or more by itself.

Design Challenge: Yarn Magic

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Extra Yarn</u> / Mac Barnett* *available at DRC	glue guns rulers	masking tape pom-poms feathers beads googly eyes	sticks pine cones leaves flowers branches yarn
Other suggested titles include: <u>Just How Long Can a Long String Be?! /</u> Keith Baker <u>Noodle's Knitting /</u> Sheryl Webster <u>The Very Busy Spider/</u> Eric Carle			

The Design Challenge

Making: Create a magic wand by wrapping yarn around a stick.

Engineering: Create a mobile using the magic wands and other items from nature.

Design Challenge: Crazy Catapults Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Olympig!</u> / Victoria Jamieson	glue guns rulers box cutters wire cutters protractor	white glue masking tape wire string elastics binder clips	wood bottle caps craft sticks tongue depressors plastic spoons clothespins twist ties pom-poms cottonballs packing peanuts dowelling
<u>Explore Simple Machines! With 25 Great Projects!</u> /Anita Yasuda			
<u>The Knight and the Dragon</u> /Tomie dePaola			
<u>Simon and Catapult Man's Perilous Playground Adventure</u> /Norne Smiley			
<u>Break the Siege: Make Your Own Catapults</u> /Rob Ives			

The Design Challenge

Making: Use a spoon as a catapult to launch a pom-pom or other lightweight object.

Engineering: Design and build a catapult that will launch a soft, lightweight object at least five feet.

Design Challenge: Squirrel-Proof Birdfeeder Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<u>Those Darn Squirrels!</u> / Adam Rubin	glue guns	paint brushes	paper towel rolls
<u>Birds of North America</u> /Golden Field Guides	rulers	paint	toilet paper rolls
<u>Birdhouses & More</u> /A.J. Hamler	box cutters	stickers	small or med boxes
<u>Backyard Birds: An</u>	wire	white glue	plastic cups
<u>Introduction</u> /Robert Bateman	wire cutters	craft sticks	clothespins
<u>Bird Watching for Kids</u> /George H. Harrison	hammers	masking tape	
<u>Handmade Birdhouses and Feeders</u> /Michele McKee-Orsini	screwdrivers	pipe cleaners	
<u>The Birds in the Backyard</u> /Lee E. Cart	pliers	string	
<u>In My Backyard Series: I See A Squirrel</u> /Alex Appleby	safety goggles	feathers	
<u>Little Backyard Animals: Squirrels</u> /John Willis		pom-poms	
<u>Squirrels Leap, Squirrels</u>			
<u>Sleep</u> /April Pulley Sayre			
<u>Life Cycles: Squirrels</u> /Julie K. Lundgren			
<u>Squirrels</u> /Caroline Norsk			
<u>The Secret Life of Squirrels</u> /Nancy Rose			

Design Challenge: Tower Power Kit

Book Titles	Suggested tools	Suggested supplies	Suggested materials
<p><u>Rapunzel</u> / Catherine McCafferty</p> <p><u>Gustave Eiffel's Spectacular Idea: The Eiffel Tower</u> /Sharon Katz Cooper</p> <p><u>Let's Investigate Everyday Materials</u>/Ruth Owen</p> <p><u>The Tree House that Jack Built</u> /Bonnie Verburg</p> <p><u>Pull, Lift and Lower: A Book About Pulleys</u>/Michael Dahl</p> <p><u>Pulleys In Action</u>/Gillian Gosman</p> <p><u>Construction Zone</u>/Cheryl Willis Hudson</p>	<p>glue guns</p> <p>rulers</p> <p>box cutters</p> <p>wire</p> <p>wire cutters</p> <p>pulleys</p>	<p>white glue</p> <p>masking tape</p> <p>elastics</p> <p>string</p> <p>craft sticks</p> <p>pipe cleaners</p> <p>paper clips</p>	<p>paper towel and toilet paper rolls</p> <p>boxes</p> <p>Pringles cans</p> <p>oatmeal boxes</p> <p>empty</p> <p>thread/ribbon</p> <p>spools</p> <p>yarn</p> <p>paper plates</p> <p>paper cups</p> <p>wooden skewers</p> <p>clothespins</p> <p>velcro</p>