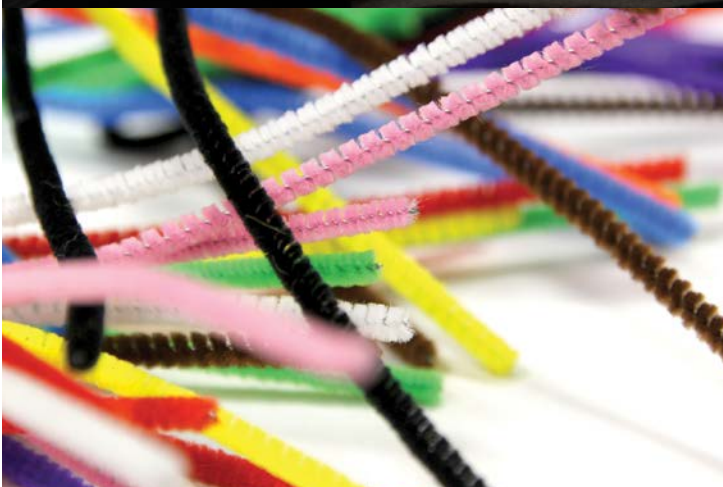




Exploring Material Properties

Improve Your Team's
Instant Challenge Skills







Exploring Material Properties Instructions

These cards are designed to teach your team material properties, creative thinking, teamwork and problem solving skills. Each card contains a set of questions and activities for a specific material.

Get Started

1. Print the following pages double-sided on 8.5" x 11" cardstock paper.
2. Cut each page in half.
3. Gather the material on the cards. 20-25 of each material should be enough to complete all the activities.
4. The icons at the top of each card indicate if scissors or weights, such as pennies or marbles, are needed.   If a card has this icon you may want to have a few other supplies.
5. Select the material and its corresponding card.
6. Read the first question on the card to your team and give them time to explore the solutions completely. The questions and activities are designed so that solutions can be used in many of the subsequent activities for that specific material.

About Destination Imagination

Destination Imagination (DI) is a non-profit, volunteer-led, cause-driven organization. Our purpose is to inspire and equip students to become the next generation of innovators and leaders. Annually, we offer seven new standards-based Challenges in STEM, Improv, Visual Arts, Service Learning, and Early Learning. Each Challenge is open-ended and enables student teams to learn and experience the creative process from imagination to innovation. Academic tournaments take place around the world where teams have the opportunity to present their solutions to trained appraisers. Students have fun and gain confidence in their ability to solve any challenge. In working to solve our Challenges, teams learn 21st century skills (creativity, critical thinking, collaboration, communication, citizenship and courage) to build on their unique strengths.

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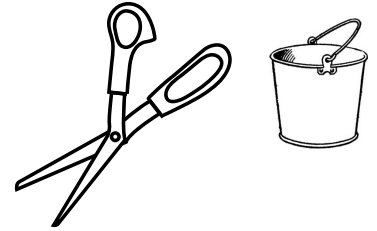
The Following Supplies are for the Exploring Material Properties.
It is recommended that you gather 20 – 25 of each material.

Balloons		Paper plates
Cardboard tubes		Pieces of foil
Chenille stems		Pieces of paper
Craft sticks		Rubber bands
Cups		Sheets of newsprint
Feet of String		Spaghetti
Index cards		Straws
Mailing labels		Toothpicks
Paper clips		



Instant Challenge Material:

Balloons (Warning: This activity uses latex balloons.)



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- ⊖ What is the farthest you can get the smallest balloon to stretch?
- ⊖ How can you create a pendulum?
- ⊖ How can you use a balloon to launch another balloon?
- ⊖ How would you use the neck of the balloon to attach two things together?
- ⊖ How many different ways can you attach the balloons together?
- ⊖ What can you use the balloons for in a costume?
- ⊖ Create a play that uses balloons to depict the story. Try to use the different shapes and/or colors of balloons to your advantage!
- ⊖ Inflate a few balloons and put them in the corner of a room. Can you transport them across the room without them touching the ground or your bodies?
- ⊖ It's not only fun to blow up balloons, but also to deflate them. Try to get a balloon to deflate slowly so it does not pop!



Instant Challenge Material:

Chenille Stems



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- ⊖ Can you create a container for materials such as marbles, pingpong balls or tennis balls?
- ⊖ How many different ways can you attach the chenille stems together?
- ⊖ Can you create a tall tower using only the chenille stems?
- ⊖ How can you create a cube?
- ⊖ How many ways can you create a device to retrieve a ball?
- ⊖ How can you communicate a message using the different colors?
- ⊖ Can you create a puppet show using only the chenille stems?
- ⊖ How can you create costume pieces?
- ⊖ Can you make three different insects out of the chenille stems?
- ⊖ What other animal features (e.g., tails or horns) can you depict using the chenille stems? Create a Presentation that includes five features!





Instant Challenge Material:

Straws



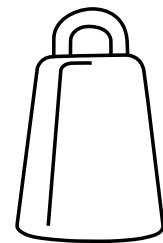
- ⊖ Can you weave straws together into a sturdy structure?
- ⊖ How many different ways can you attach straws together?
- ⊖ Can you make an assortment of jewelry that includes necklaces and rings?
- ⊖ How can you create a bridge?
- ⊖ What is the tallest structure that you can make using only the straws?
- ⊖ Can you create a vehicle out of straws? How about a device that can transport the vehicle?
- ⊖ How can you create a device to transport straws from one pile to another?
- ⊖ Can you create a Presentation that uses straws to provide sound effects?

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Instant Challenge Material:

News Print



- ⊖ What is the longest tube that you can make?
- ⊖ What is the tallest structure that you can make?
- ⊖ Can you create a dome that a team member can sit in?
- ⊖ How can you create the longest continuous strip possible from the newsprint?
- ⊖ How can you use the news print in a costume?
- ⊖ Can you create three origami animals using large sheets of news print? Create a Presentation about your origami animals!
- ⊖ Can you create a Presentation based on newspaper headlines?
- ⊖ Can you create a Presentation that uses a picture in the newspaper taken out of context?
- ⊖ Make a device to launch and catch crumpled news print balls.
- ⊖ How can you make the tallest tower possible that holds as much weight as possible?

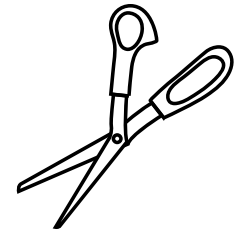
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Instant Challenge Material:

Cups



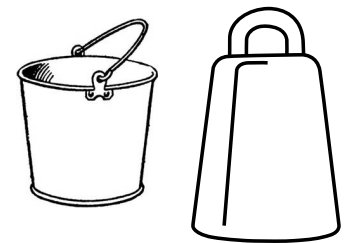
- ⊖ How can you create a mask?
- ⊖ How can you create a creature with moving body parts?
- ⊖ What is the tallest tower that you can create?
- ⊖ How can you create a Presentation only using imaginary cups?
- ⊖ How can you create the longest continuous strip from a single cup?
- ⊖ How can you use the cups to create a bridge?
- ⊖ What can you do with the cups without destroying them?
- ⊖ What kind of sound effects can you make with the cups?
- ⊖ Imagine if the world were entirely made up of cups, and create a Presentation about it!
- ⊖ Can you create a piece of art using only cups? How about a presentation that explains the art piece to a panel of art museum curators?

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Instant Challenge Material:

Foil



- ⊖ What is the smallest structure that you can make that floats on water?
- ⊖ What is the largest structure that you can make that floats on water?
- ⊖ Can you build a boat that can hold pennies, marbles or other "passengers?"
- ⊖ How can you use the foil in a costume?
- ⊖ Try playing a game of charades using only foil to convey ideas.
- ⊖ How can you fold or rip the thinnest strip of foil?
- ⊖ How can you create the tallest and thinnest structure possible?
- ⊖ Can you create a musical instrument made of foil?
- ⊖ Using only foil, how can you deliver water from one side of the table to the other?
- ⊖ Can you think of way to use foil to convey a message, without talking, to someone across the room?

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Instant Challenge Material:

Popsicle Sticks



- ⊖ Using the popsicle sticks, what is the tallest structure that you can make with a base that fits entirely on this photograph?
- ⊖ Basket makers weave strips of fiber together to make their baskets. Can you weave or cross-hatch the popsicle sticks together to make a sturdy structure?
- ⊖ How many different ways can you attach the popsicle sticks together?
- ⊖ What is the longest bridge that you can make using the popsicle sticks?
- ⊖ Can you create a game based on the popsicle sticks (as game pieces, tokens, etc.)?
- ⊖ How can you tell a story using the popsicle sticks to depict a scene?
- ⊖ How can you create a device to launch the popsicle sticks?
- ⊖ Can you create a puppet show that uses only popsicle-stick puppets?
- ⊖ How can you create a Presentation with popsicle-stick shadow puppets?
- ⊖ How can you communicate a message without talking, using only the popsicle sticks?

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Instant Challenge Material:

Stickers (Mailing Labels)

- ⊖ What is the tallest structure that you can make?
- ⊖ How can you create a linked chain from the stickers?
- ⊖ How many different ways can you attach the stickers together?
- ⊖ What can you do with the sticker backing?
- ⊖ What is the largest sticky surface that you can make?
- ⊖ What is the largest non-sticky surface that you can make?
- ⊖ Can you build a bridge of stickers that spans a 1ft (30cm) gap?
- ⊖ Can you think of a way to use the stickers to create a trap or case to hold small objects?
- ⊖ Can you think of a way that stickers could convey a message? Create a Presentation that features stickers conveying a message to a character!

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Instant Challenge Material:



String

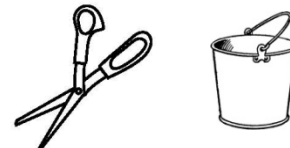
- ⊖ Create a way to knock over dominoes
- ⊖ Convert a 12" piece into 30"
- ⊖ How many ways can you use string to retrieve small spherical and cube shaped objects?
- ⊖ Use the string to create a separation device to group different objects
- ⊖ How can you use the string to transport an object without a team member touching it



Additional supplies might be mailing labels, paper clips



Instant Challenge Material:

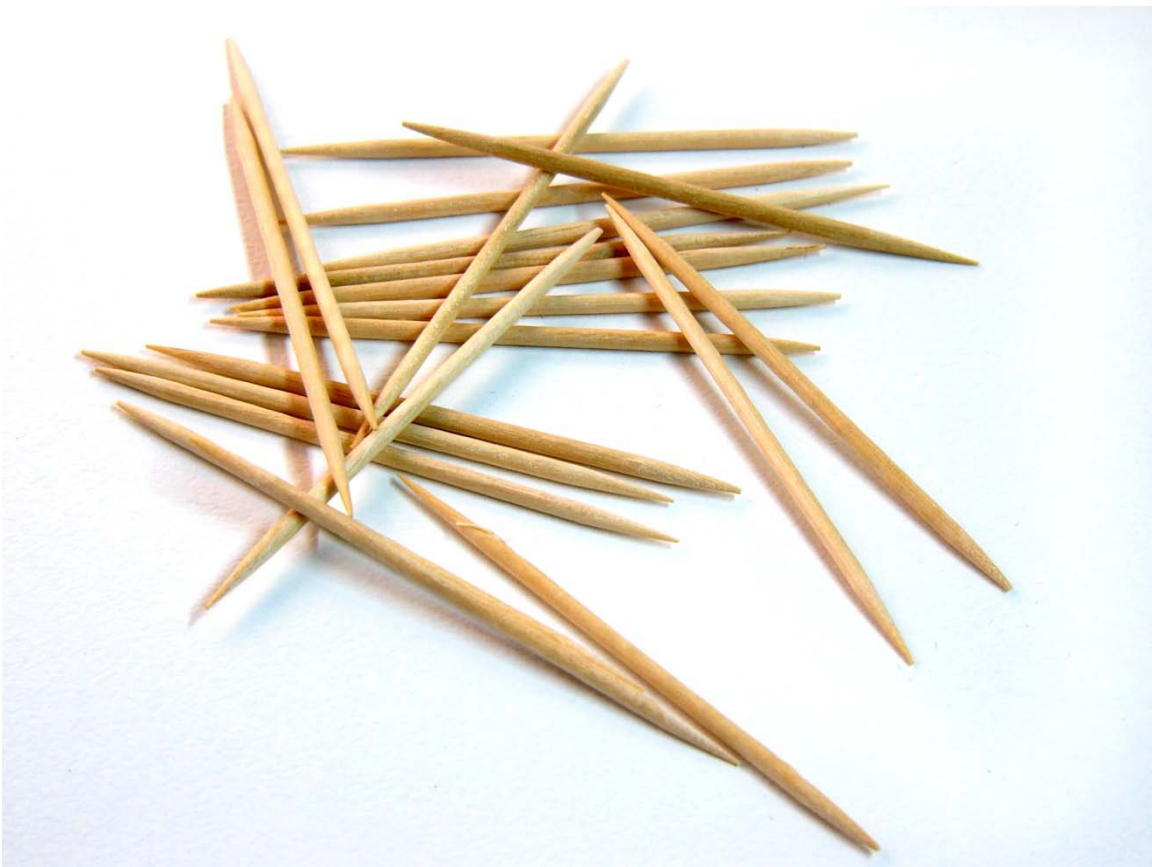


Rubber bands

- ⊖ Can you create exercise equipment for small animals
- ⊖ Create a way to use rubber bands to teach young children geometry
- ⊖ How many rubber bands can you connect together before they start to sag
- ⊖ Create part of a costume
- ⊖ Create a device to keep things from moving
- ⊖ Can you keep small items from falling
- ⊖ Can you create a musical instrument
- ⊖ Can you make items travel a given distance
- ⊖ Create a stored energy toy



Additional supplies paper clips, toothpicks, marbles or ping pong balls.



Instant Challenge Material:



Cardboard Tubes

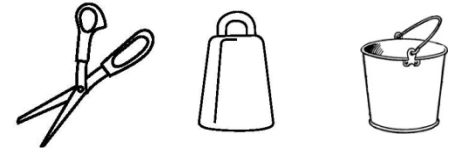
- ⊖ Build a system to carry marbles from one place to another
- ⊖ Build the tallest structure out of 6 toilet paper rolls
- ⊖ Create a kaleidoscope with a toilet paper roll
- ⊖ Create a animal using rolls and create a play featuring this animal.
- ⊖ Create a sculpture using rolls
- ⊖ What type of prop could you create using only toilet paper rolls?



Additional supplies might be mailing labels, paper clips, toothpicks



Instant Challenge Material:



Toothpicks

- ⊖ Create models of sculptures for a park and presentation about what they represent.
- ⊖ Can you create a device made from toothpicks to dislodge marbles from clay.
- ⊖ Create miniature house furniture & present a story about its occupants.
- ⊖ How many ways can you use toothpicks hold things together
- ⊖ Stabilize/strengthen structures made from straws, paper, or chenille stems.
- ⊖ Use toothpicks to pick up other objects?
- ⊖ Create something that will float and hold weight.
- ⊖ Use the toothpicks to create an accessory for a costume.
- ⊖ Create a device to move a heavier object 2 feet away.



Additional supplies mailing labels, toothpicks, straws, string.





Instant Challenge Material:



Paper

- ⊖ How many ways can you use paper to make one long strip?
- ⊖ Create different sizes of columns.
- ⊖ Using the columns, build a tall tower.
- ⊖ How can you create a cube?
- ⊖ Create a moving paper doll.
- ⊖ What are some ways to connect paper?
- ⊖ Build a bridge that will hold weight.



Additional supplies might be mailing labels, paper clips, toothpicks



Instant Challenge Material:



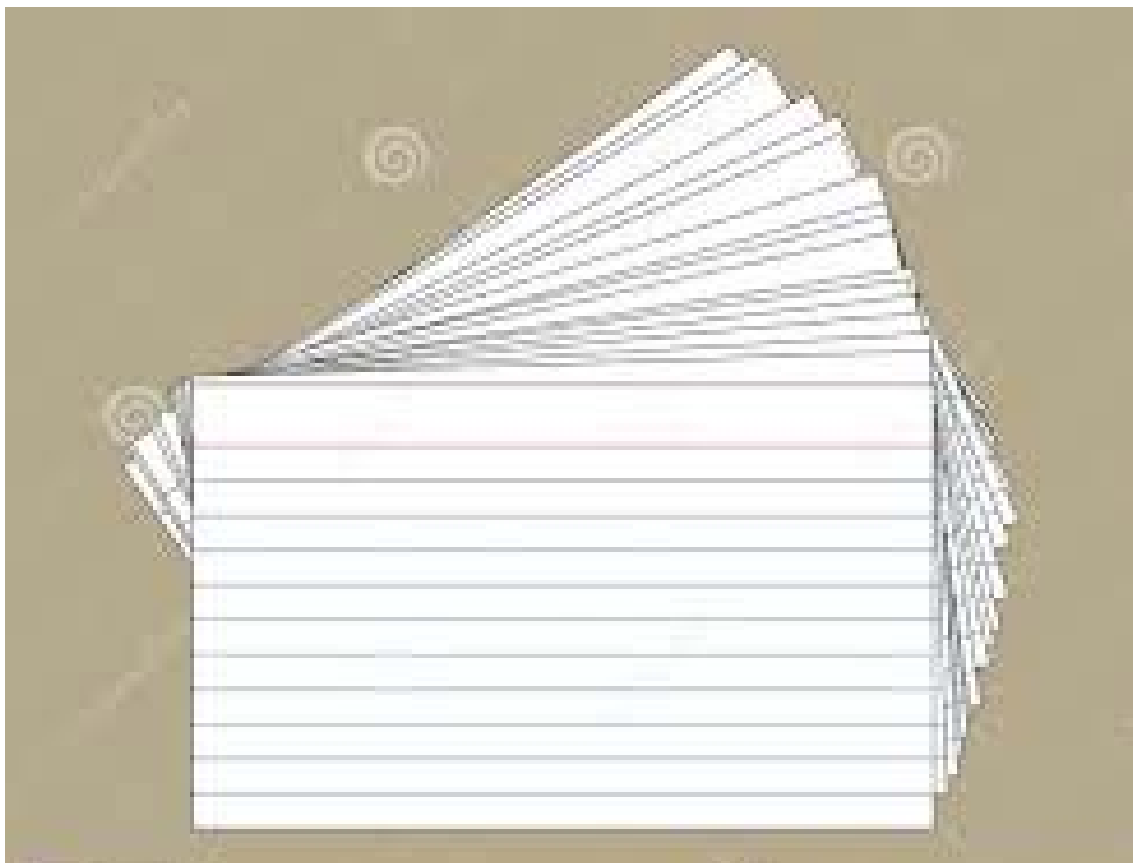
Paper Plates

- ⊖ Create a toy using a paper plate
- ⊖ Create a mask using a paper plate.
- ⊖ Create a musical instrument using paper plates.
- ⊖ Design a prop or costume that uses paper plates
- ⊖ How might you use a paper plate to strengthen a structure?
- ⊖ How can you communicate a message without talking, using only paper plates?



Additional supplies mailing labels, paper clips, toothpicks, straws, spaghetti, string, rubber bands.







Instant Challenge Material:

Spaghetti

- ⊖ How can you use spaghetti to strengthen a structure?
- ⊖ Create a device to hold items together
- ⊖ Use spaghetti to create a scientific model
- ⊖ How can you create a bridge out of spaghetti?
- ⊖ How might you incorporate spaghetti into a costume or a prop?



Additional supplies might be straws, mailing labels, paper



Instant Challenge Material:

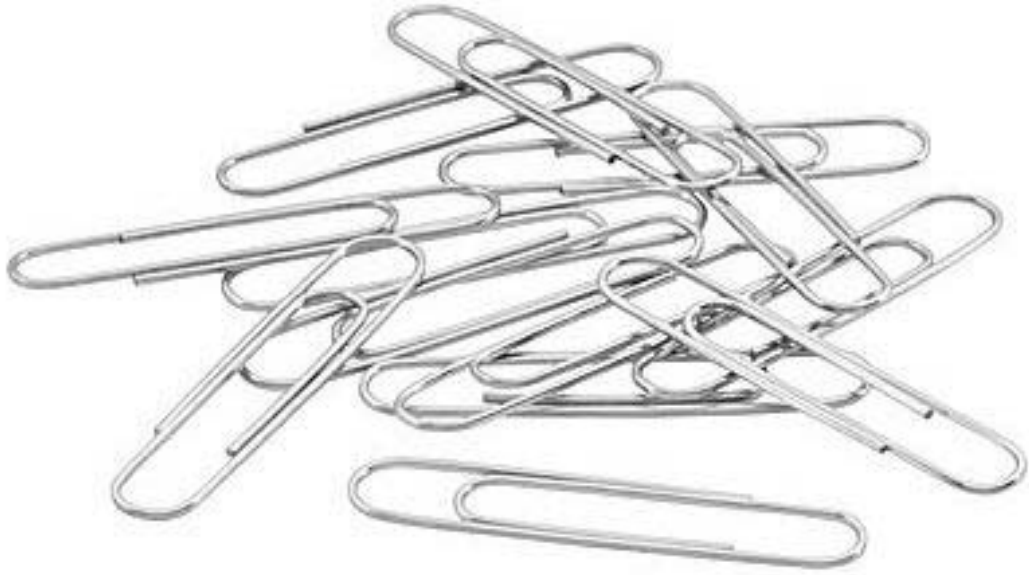


Index Cards

- ⊖ Create a maze for a marble or ping pong ball
- ⊖ Create a structure that will span a distance and support weight
- ⊖ Create a presentation about index cards in which person is an index card.
- ⊖ Design a communication system to send secret message or directions
- ⊖ How can you create the tallest and thinnest structure using index cards?
- ⊖ What are different ways to connect index cards?
- ⊖ Build a tower using only index cards
- ⊖ Create a game using index cards.



Additional supplies mailing labels, paper clips, marbles, ping pong balls.





Instant Challenge Material:

Paper Clips

- ⊖ How many different ways can you connect paper, straws, etc with paperclips
- ⊖ How can you use paper clips to stabilize paper, straws, etc.
- ⊖ Can you create miniature characters with the paper clips.
- ⊖ How can you use the paper clips build an airplane
- ⊖ How can you use paper clips as weights?
- ⊖ Create a device to span a distance
- ⊖ Can you make a part of a costume?
- ⊖ Can you make a playground for ants?
- ⊖ Can you make a musical instrument?
- ⊖ Can you create toys for a hamster?



Additional supplies might be straws, paper, string

