ClassMonitor

# STEM Activities

ClassMonitor

# Name Of Activity- Build A Tower

**Activity Intro:** The challenge is to build the tallest possible tower to save Brownie from an oncoming flood.
The STEM area in focus is 'Engineering'- building something of strength and stability by experimenting with available material.

**Concepts in Focus:**

-Structural Stability

**Material Required:**

**Activity Sheets-**

-Build A Tower Challenge -1 Card
-Build A Tower- Cue Card- 1
-Build A Tower- Little Discoveries 1

**STATIONERY-**

-Popsicle Sticks -10
-Paper Cups - 10
-Small Toy Figure - 1 (Referred to as Brownie in the activity)

**Activity Aims:** Development of Problem Solving Skills, Understanding the concept of structural stability, Discovering creative and multiple solutions to a problem, Discovering creative and different ways to use available resources to achieve a solution

**Steps:**

**Step 1**

Keep the material on the work desk.

Take 'Build a Tower- Challenge Card 1', 10 Popsicle Sticks and 10 Cups.

**Step 2**

Build a story around how a flood is approaching Brownie's village.

Tell the child that he/she has to build a tall tower to save Brownie.

Show them all the cups and sticks.

Allow them to stack these to build a tower.

Encourage them to use all the sticks and cups.

Follow the 'Build A Tower- Cue Card 1' to understand the stepwise process-

**Step 3**

Tell them to test the tower they have built by placing Brownie on top of it.

If the tower tumbles, discuss what could have gone wrong and allow the child to experiment with different ways to fix it.

Use the 'Build a Tower- Little Discoveries Card 1' to explain the science behind the given experiment.

Now the child has understood the concept of building a stable tower. You can provide variant challenges by telling them to use not more than 5 cups and as many sticks as they like or vice versa.The test of the stability of the tower is to be done by placing Brownie on top. All adjustments and corrections are to be done by the child.

# Build A Tower

## Cue Card-1

UNIT-1
Activity-5

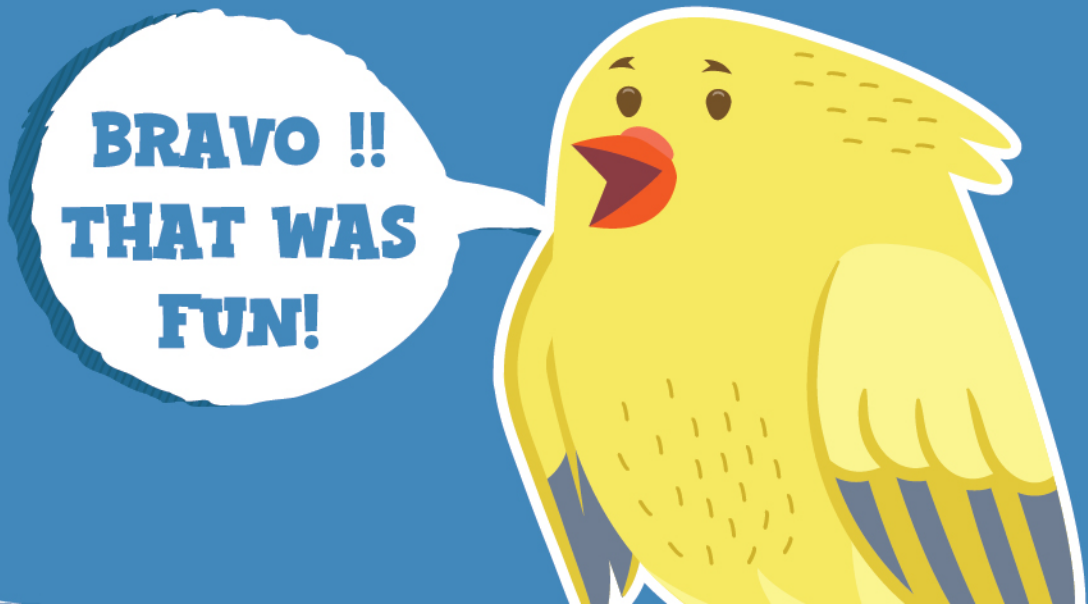
**STICKS INCREASE STABILITY & A STABLE TOWER CAN BEAR WEIGHT**

# Build A Tower

## Little Discoveries-2

UNIT-1
Activity-5

- Cups Can Be Stacked Without The Sticks To Build A Tower.
- Sticks Can Be Used In Different Ways To Provide A Stable Base.
- 'Pyramid Building' Is One Way To Build A Tower.
- Repeating The Same Pattern Can Also Be A Way To Build A Tower.



# Build A Tower

## Challenge Card-1

UNIT-1
Activity-5

There Is A Big Flood Coming.
Can You Use All 10 Cups And 10 Sticks
To Build The Tallest Tower Possible To
Save **BROWNIE** From The Flood?

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# Name Of Activity- Paper Cup Rocket

**Activity Intro:** In this activity the child uses paper cups to create a toy rocket that pops up.
This activity introduces the child to the scientific principle of spring action.
The STEM Areas In Focus- 'Science' & 'Technology'.

**Material Required:**

**ACTIVITY SHEETS-**

-Paper Cup Rocket- Challenge Card
-Paper Cup Rocket- Cue Card
-Paper Cup Rocket-Little Discoveries

**STATIONERY-**

-Paper Cups- 3
-Rubber Bands- 2
-Toothpick-1
-Coloured Origami Paper-1
-Safety Scissors
-Glue

**Activity Aim Tag:** Observation Skills, Developing Scientific Curiosity, Experimentation Skills, Fine Motor Skills, On Task Focus

**Step 1**

Use 'Paper Cup Rocket- Challenge Card' to introduce the STEM Activity.

**Step 2**

Follow the 'Paper Cup Rocket- Cue Card' to understand the stepwise process for creating the toy.

**Step 3**

Place all the material on the work desk.

Place one cup on top of the other. Punch one hole each on either side of the cups.

**Step 4**

Thread a rubber band from one end to the other.

**Step 5**

Now using a piece of toothpick, secure it.

**Step 6**

This is how you can secure the rubber band with the help of the toothpick.

**Step 7**

Thread another rubber band across, to make a plus as shown-

**Step 8**

Make a cone for the rocket head.

**Step 9**

Apply glue on the base rim of the cup.

**Step 10**

Paste the cone on the base rim of the paper cup.

**Step 11**

Decorate the rocket as you like.

**Step 12**

Now press down the rocket on the other cup and see it blast off.

**Step 13**

Use the 'Paper Cup Rocket- Little Discoveries Card' to explain the concept.

# Paper Cup Rocket

## Cue Card

UNIT-2
Activity-7

1. Place One Cup On Top Of The Other. Punch One Hole Each On Either Side Of The Cups.

2. Thread A Rubber Band From One End To The Other.

3. Using A Piece Of Toothpick Secure The Rubber Band.

4. This Is How You Can Secure It.

5. Thread Another Rubber Band Across To Make A Plus As Shown.

6. Make A Cone For The Rocket Head.

7. Apply Glue On The Base Rim Of The Cup.

8. Paste The Cone On The Base Rim Of The Paper Cup.

9. Decorate The Rocket As You Like.

10. Now Press Down This Rocket On Another Cup And See It Blast Off.

# Paper Cup Rocket

## Challenge Card

UNIT-2
Activity-7

CAN YOU MAKE A PAPER CUP ROCKET THAT POPS UP ON ITS OWN?

# Paper Cup Rocket

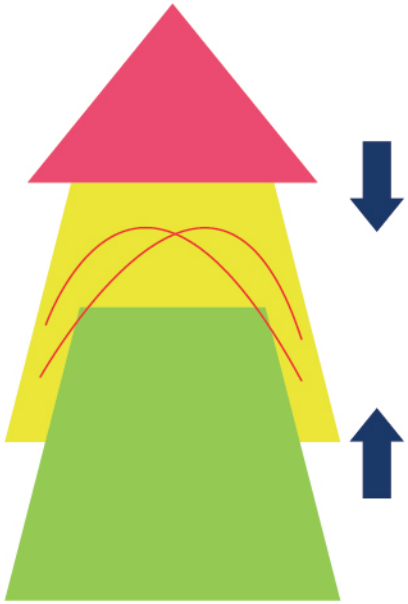
## Little Discoveries

UNIT-2
Activity-7

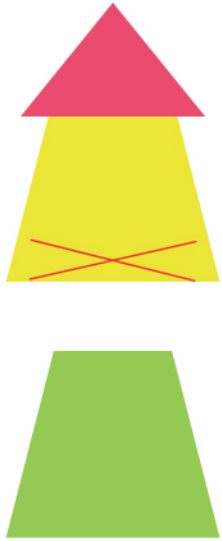
Rubber Bands' Normal Position.

Paper Cup.

Paper Cup Is Pushed Downward.



Rubber Bands Are Pressed Upward By The Lower Cup.



The Rubber Bands Return To Their Normal Position, Pushing Downward. Hence They Make The Rocket Cup Bounce Off.

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# Name Of Activity-Da Vinci's Bridge

**Activity Intro-** In this activity, the child builds a self-supporting bridge which stands and holds without any mechanical fasteners or adhesives.

An intricate pattern is woven using popsicle sticks to build a weight bearing bridge. It is based on a design by Leonardo da Vinci.

The STEM Areas in Focus are 'Science' & 'Engineering'.

**The Concepts in Focus:**
It introduces the child to the magic of engineering of the past and how balance and friction work together to create this miracle

**Material Required:**
**ACTIVITY SHEETS-**

-Da Vinci's Bridge - Challenge Card
-Da Vinci's Bridge - Cue Card
-Da Vinci's Bridge - Observation Sheet

**STATIONERY-**

-Colourful Popsicle Sticks
-Marker

**Activity Aim:** Following Instructions, Observation Skills, Fine Motor Skill Development, Developing Scientific Curiosity, Experimentation Skills

**Steps-**

**Step 1**

Place all the material at the workstation.
Seat the child comfortably.

**Step 2**

Use 'Da Vinci's Bridge- Challenge Card' to introduce the STEM Experiment.

**Step 3**

Follow the 'Da Vinci's Bridge- Cue Card' to understand the stepwise process.
The child might need help in understanding how to place the sticks, however, allow them to place the sticks themselves. You can give guidance wherever necessary.

**Step 4**

It is important to note the spacing and the way each stick has been woven.
The sticks are coloured to ease replicating the pattern.

**Step 5**

The bridge will lift and curve after few steps.
Once the bridge is ready, note that it can only bear weight from the top. Movement from the sides will break it.

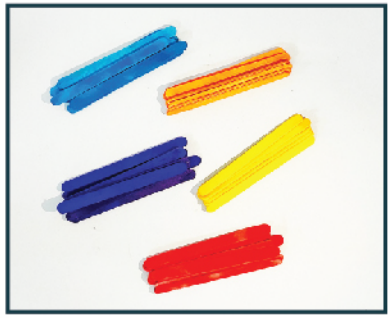
**Step 6**

Test it gradually and record how much weight it can bear.
Once the experiment is conducted, use the 'Da Vinci's Bridge- Observation Sheet' to help the child observe and record what they have seen and learnt.

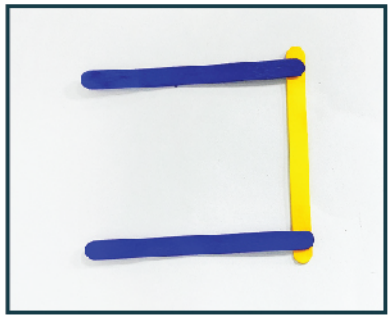
# Da Vinci's Bridge

## Cue Card

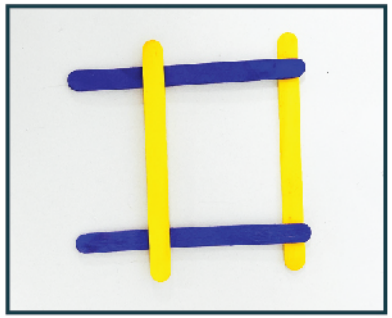
UNIT-3
Activity-1



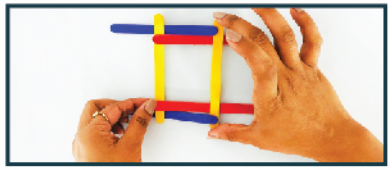
1. Keep All The Popsicle Sticks On The Work Station.

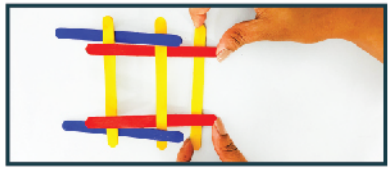


2. Place One Stick Vertically. Now Place Two Sticks Horizontally On Top Of It.

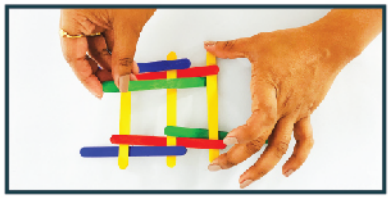


3. Place One Stick Vertically On Top Of The Two Horizontal Sticks As Shown.

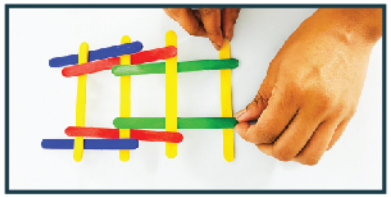




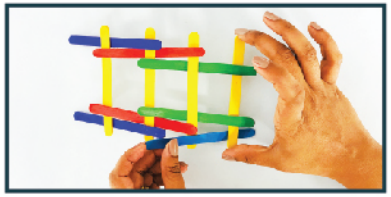
4. Lift The Lower Vertical Stick And Then Thread Two Sticks, From Below The Vertical Sticks Such That The Ends Rest On The First Vertical Stick.



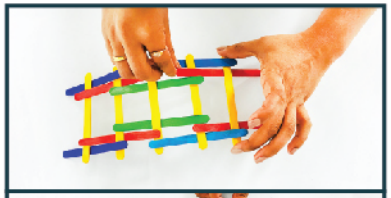
5. Now Place Another Stick Below The Second Set Of Horizontal Sticks.

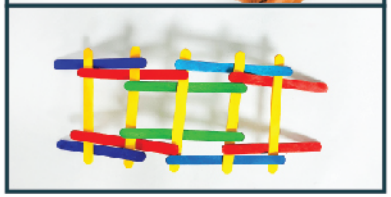


6. Now Lift The Third Vertical Stick And Thread Two Sticks From Below Such That They Rest On Second Vertical Stick.



7. The Two Horizontal Sticks Now Need To Be Threaded From Below The Fourth Vertical Stick Such That They Rest On The Outer Edges Of The Fourth Vertical Stick.





8. Continue Repeating The Process, Alternating The Locations Of The Supporting Horizontal Sticks Until You Have A Clearance Of 2 Inches On The Surface You Are Building On.

Pattern Of The Horizontal Sticks Placement:

1 Time Outside

2 Times Inside

1 Time Outside And So On.

# Da Vinci's Bridge

## Challenge Card

UNIT-3
Activity-1

CAN YOU BUILD A BRIDGE WITH STICKS WITHOUT USING ANY ADHESIVE? IT SHOULD BE ABLE TO BEAR WEIGHT.

# Da Vinci's Bridge

## Observation Sheet

UNIT-3
Activity-1

- If You Press It Downwards Does It Break?

YES ☐ NO ☐

- Can It Hold The Weight Of A Small Object?

YES ☐ NO ☐

- Can It Hold The Weight Of A Cup?

YES ☐ NO ☐

- How Many Things Can It Hold All At Once? (Write The Number Or Draw The Things.)

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# Name Of Activity-Secret Message

**Activity Intro-** In this activity, the child creates an invisible ink and learns how to make the writing visible. The child is introduced to what chemistry is and what chemical reactions are. They are made aware of all the chemical reactions that keep happening around us.

This activity creates scientific curiosity in the child and makes them look at things around them with a cause and effect perspective.

The STEM area in focus is 'Science'.

**Material Required:**

**ACTIVITY SHEETS-**

-Secret Message- Challenge Card
-Secret Message- Cue Card
-Secret Message- Little Discoveries
-Secret Message- Little Discoveries- Chemistry Around Us
-Secret Message- Worksheet

**STATIONERY-**

Detergent
Turmeric
Alcohol Based Hand Sanitizer
Water
Brush
A4 White Paper

**Steps-**

**Step 1**

Use 'Secret Message- Challenge Card' to introduce the STEM Experiment.

**Step 2**

Follow the 'Secret Message- Cue Card' to understand the stepwise process-

**Step 3**

Keep all the material on the work desk.

**Step 4**

Fill the cup halfway with water. Add detergent to it and stir well.

**Step 5**

Take a paper towel and put the card sheet over it to avoid spillage.
Restir the detergent solution and write a message on your card sheet. Let it dry.

**Step 6**

Take hand sanitizer and turmeric in a cup, stir well to make a solution.

**Step 7**

Keep the dried secret message back on the paper towel and dip a brush in the turmeric solution and start painting on the card sheet.

**Step 8**

Voila! Your invisible ink works.

**Step 9**

Use the 'Secret Message- Little Discoveries Card' to explain the science behind the experiment.

**Step 10**

Once the experiment is conducted, use the 'Secret Message- Worksheet' to make your own Chemical Reaction and draw the correct answer.

# Secret Message

## Cue Card

UNIT-3
Activity-8

Let Us Learn The Process Of Making Invisible Ink!

1. Keep All The Material On The Work Desk.

2. Fill The Cup Half Way With Water. Add Detergent To It. Stir Well.

3. Take A Paper Towel And Put The Card Sheet Over It To Avoid Spillage.

4. Restir The Detergent Solution. Allow Your Child To Write Or Draw A Message On The Card Sheet. Let It Dry.

5. Take Hand Sanitizer. And Turmeric In A Cup. Stir Well To Make A Solution.

6. Keep The Dried Secret Message Back On The Paper Towel.


7. Dip A Brush In The Turmeric Solution, And Paint Over The Message.


8. Voila! Your Invisible Ink Works!

# Secret Message

## Challenge Card

UNIT-3
Activity-8

WOULD YOU LIKE TO SEND A SECRET MESSAGE TO SOMEONE WHICH NO ONE ELSE CAN READ?

# Secret Message

UNIT-3
Activity-8

## Little Discoveries - Chemistry Around Us

Discuss How The Following Are Chemical Reactions.

A SNEAK PEAK INTO THE CHEMICAL REACTIONS AROUND US!

- Salt Or Sugar Dissolved In Water.
- Cake Baking.
- Pepsi Fizzing.
- Making Slime With Glue.
- Eno Mixed In Water.
- Eggs Getting Cooked On A Pan.
- Rice Becoming Soft On Boiling.
- Eggs Hardening On Boiling.
- Tools Rusting And Turning Red.
- Leaves Turning Brown.
- Clothes Drying.
- Water Freezing To Make Ice.

A Chemical Reaction Is A Process In Which A Substance, When Mixed With Another Substance, In The Presence of Heat, Cold Or Light, Makes A New Substance.

THE PROCESS IS CALLED A CHEMICAL REACTION.

# Secret Message

UNIT-3
Activity-8

## Little Discoveries

The Detergent Solution Is Alkaline Or Basic. It Gets Absorbed By The Paper And Once Dried Isn't Visible Anymore. When We Apply Turmeric And Sanitizer Solution To It, Magic Happens! When Turmeric Comes In Contact With An Alkaline Or Basic Substance Such As The Detergent On The Paper, It Turns From Yellow To A Deep Red. Your Secret Message Gets Revealed!

Message Written In Our Invisible Ink.


Turmeric Which Is Yellow In Neutral State, Turns Red When It Comes In Contact With Detergent.


Adding Turmeric Into A Basic Solution (Detergent Solution), Changes It To A Deep Red Colour.

# Secret Message

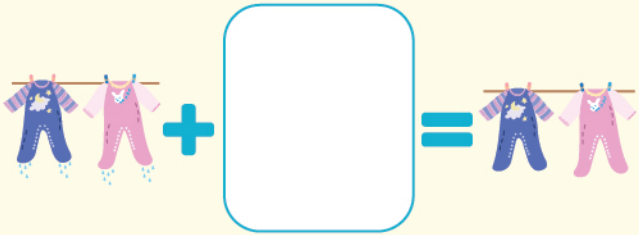
## Worksheet

UNIT-3
Activity-8

Let's Make Our Own Chemical Reactions. Draw The Correct Answer.

Water + Cold = _____

Egg + _____ = Fried Egg



Wet Clothes + _____ = Dry Clothes

Lemon + Water + Sugar = _____

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# Name Of Activity-Measurement and Comparison

**Activity Intro-** In this activity the child measures different images using play dough and then compares and sorts them as per their length/height. This activity teaches the child about non standard measurement of length and height and quantifies it in understandable terms without using numbers. It encourages assessment, quantification and approximation abilities of the child. It also helps develop motor skills as the child kneads and rolls play dough.

The STEM area in focus is 'Math'.

**Material Required:**
**ACTIVITY SHEETS-**

-Measurement and Comparison- Challenge Card
-Measurement and Comparison- Measurement Mat
-Measurement and Comparison- Toy and Animal Cutouts

**STATIONERY-**

-Play dough

**Activity Aims:** Fine Motor Skills, Approximation Abilities, Spatial Understanding, Quantification of length and height in non-numeric terms for comparison.

Steps-
Step 1
Use 'Measurement & Comparison- Challenge Card' to introduce the STEM Activity.

**Step 2**

Place the 'Measurement & Comparison- Measurement Mat' and play dough on the workstation.

**Step 3**

Keep the 'Measurement & Comparison- Activity Cutouts Sheets' in front of your child. Ask the child to select the theme they wish to measure first.

**Step 4**

Give one image at a time from the given set. Place it on the 'Measure The Picture' box, given on the Measurement Mat.

**Step 5**

Ask your child to roll the play dough and place it along the image to measure the length/height.

Once they have measured the image, they have to place the playdough rope on the number in the comparison box.

**Step 6**

After all the images of the sheet are measured, they can compare which is the tallest/longest and which is the shortest and arrange them in ascending order in the third window- Arrange in order.

Use different colours of play dough if possible, to measure height and length for clarity.

Use the cutouts to reinforce image identification, colour identification as well as uses of the object.

Step 7

Use the play dough and Measurement Mat to measure small things around the house.

You can also replace the play dough with string or blocks or thumbprints to show different ways to measure.

# Measurement and Comparison

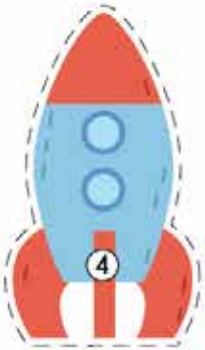
UNIT-2
Activity-6

## Activity Cutouts

Measure The Height

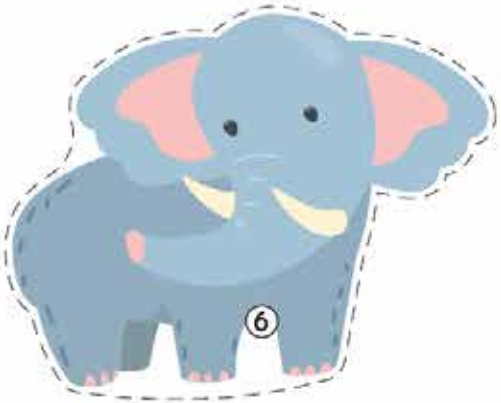
### TOY SET






### ANIMAL SET





# Measurement and Comparison

UNIT-2
Activity-6

## Measurement Mat

MEASURE THE PICTURE

PLACE PLAYDOUGH ALONG THE RESPECTIVE NUMBER

1 2 3 4 5 6

ARRANGE IN ORDER (TALLER TO SHORTER/SHORTER TO TALLER/LONGER TO SHORTER/SHORTER TO LONGER)

# Measurement and Comparison

## Challenge Card

UNIT-2
Activity-6

CAN YOU USE PLAY DOUGH TO MEASURE AND COMPARE DIFFERENT OBJECTS?