
CLASSROOM CHALLENGE ACTIVITIES



Introduction to Student Activities in STEM and Creativity

What are DESTINATION IMAGINATION® Classroom Activities?

The enclosed Classroom Activities or Challenges have been developed by Destination Imagination, Inc. as part of our Destination Imagination school/community based program. The 10 introductory Challenges have come from writers in industry and education, and can be used for 21st century skill and STEM assessments.

These Challenge Activities require students to engage in collaboration, creative and critical thinking. During a Challenge, participants are able to work together to find solutions to presented scenarios. The participants must think on their feet by applying 21st century skills and knowledge to produce a solution within a short time period of usually less than 10 minutes. These Challenges easily fit into any class schedule.

All of the Activities are Performance Based, Task Based, or a combination of the two. Performance-based Challenges require the participants to devise some presentation related to the challenge which can sometimes involve materials and sometimes not. A Task-based challenge will often require some readily available supplies and the participants will be asked to create something for their solution.

Most Activities incorporate components of STEM (Science, Technology, Engineering and Math) and the Arts, which align with the 21st century skills framework (see P21.org) as well as the Common Core Standards used by educators.

How does it work?

Students will collaborate and work together on any given Challenge Activity. The teacher will first gather all the necessary materials and set up a space for the students to work. Typically, a table and workspace will be sufficient. The Teacher/Facilitator will then read the students their challenge and give them a period of time to develop a solution, which may just be spoken or acted-out or may require creating something from materials provided.

Remember, there is no right or wrong solution to a Challenge. They are intentionally designed to have multiple solutions. You may choose to have groups do the same Challenge several times to show how alternate ideas can also work.

If you are working with very young learners it is important to emphasize working together, a concept that may be new to many of the children. Switch things around or alter the group make-up to ensure that each child has the opportunity to participate fully. Also, keep in mind that you can easily modify challenges to better meet the needs of your group or the materials you have on hand.

Processing Questions:

After facilitating a challenge with the group, it is important that the participants discuss the experience. The teacher's job is to facilitate the discussion as necessary, without telling the students exactly what to do. By processing each challenge, the students will begin to self-assess and become better at both understanding their strengths and working on their weaknesses. Real learning takes place during processing, so do not skip this important part. Destination Imagination Challenge Activities are written so both the teacher and the students can benefit from Processing Questions. Below are some examples:

For the students the questions might be:

- What was fun about this challenge?
- Would you change anything you did?
- What new things did you learn?

For the teachers:

- Was it fun for the group? Why?
- Were the participants engaged with each other and the challenge?
- Could anything be changed to make this challenge better for the group?

Forming a Competition for Student Assessments

As mentioned earlier, Destination Imagination Challenges have been developed for use with our DESTINATION IMAGINATION® program; however anyone can have fun with the challenges! Each activity includes a scoring procedure which will allow the teacher to turn the challenge into a competition. The Activities are designed to engage students in a fun learning exercise. Whatever the ability level or age of your participants, everyone can have fun and learn critical life skills through the creative process. For information on forming a Destination Imagination team and other offerings, please visit our website at: www.destinationimagination.org.

Learning Objectives

- Expert Intuition
- Mindfulness
- Creativity
- A Completion Mindset
- Communication
- Collaboration
- Conflict Management
- STEM concepts
- Project Management Skills

Low budget strategy for teaching the following:

- Properties of materials, modeling, presenting, measuring, comparing and contrasting, geometric design, problem solving, planning, organizing, sequencing, perseverance, extending, connecting, controlling, time management, estimating, span technology, testing, aesthetics (value/ethics/art), budgeting, geometry, physics
- Communications, collaboration, creativity, critical thinking, courage, citizenship, computer usage
- How to break complex tasks into smaller tasks – remove feeling of being overwhelmed
- Teach progress not perfection
- Positive attribution
- Use to identify student strengths

Classroom Activities:

1. Select Your Words Carefully
2. New Constellations
3. Just Straws
4. You Build It – You Measure It
5. Space Station
6. Will It Stick
7. Multi-Towering
8. Bridge to Nowhere
9. Stack 'em Up
10. Kids' TV

SELECT YOUR WORDS CAREFULLY

Challenge

Your team is to present a PERFORMANCE in which you tell a story using only 7 words and pantomime.

For the purpose of this Challenge, "pantomime" means using only body movements to tell a story.

Time

You will have up to 4 minutes to draw 7 cards that each contains a word and to use your IMAGINATION to plan and practice your skit, and then up to 2 minutes to present your PERFORMANCE to the Appraisers.

The Scene

Sometimes it's important to limit what you say. In this Challenge you will need to tell a story using only 7 words and pantomime.

- Part One (4 minutes): Draw 7 cards. Each card contains 1 word. These are the only words that may be spoken in your PERFORMANCE. Plan and practice your skit. Your skit should have a beginning, a middle and an end. Be sure to have at least 1 team member say each of the 7 words you chose in your skit.
- Part Two (2 minutes): Present your skit to the Appraisers.

Materials

A piece of paper and a sharpened pencil will be available for your team to use as you plan and present your PERFORMANCE.

Scoring

You will receive:

10 points if your skit has a beginning, a middle and an end.

- A. 5 points (35 points maximum) for each different word on a card that is used in your PERFORMANCE.
- B. 5 additional points if all 7 words are used in the PERFORMANCE.
- C. 30 points for the creativity of your PERFORMANCE.
- D. 20 points for how well your team works together.

STEM CONCEPTS

- Math
- Creativity
- Communication
- Collaboration
- Problem Solving
- Innovation

NEW CONSTELLATIONS

Challenge

Your TASK is to create a new constellation and then give a PERFORMANCE in which you tell the story of how the constellation got its name.

Time

You will have up to 4 minutes to use your IMAGINATION and PROBLEM SOLVING SKILLS to create your constellation, as well as to plan and practice your PERFORMANCE, and then up to 2 minutes to present your skit to the Appraisers.

The Scene

In the center of the room is an overhead projector. On top of the overhead projector is a piece of clear plastic. By placing sticky dots on the plastic, a constellation can be created.

- Part One (4 minutes): Place sticky dots on the piece of plastic to create a new constellation. You may also use Part One to plan and practice your skit.
- Part Two (2 minutes): Present your PERFORMANCE to the Appraisers. In your skit you should tell the story of how the new constellation got its name.

Materials

- Sheet of Clear Plastic
- 20 Sticky Dots

A piece of paper and a sharpened pencil also will be available for your team to use as you plan and practice your PERFORMANCE.

Scoring

You will receive:

- A. 20 points if you create a new constellation in Part One.
- B. Up to 10 points for the creativity of the name of your new constellation.
- C. Up to 20 points for the creativity of how the new constellation got its name.
- D. Up to 30 points for the creativity of your PERFORMANCE.
- E. Up to 20 points for how well your team works together.

STEM CONCEPTS

- Creativity
- Critical Thinking
- Imagination
- Communication
- Collaboration
- Novelty

JUST STRAWS

Challenge

Your Architectural Firm has been engaged to build a scale model of a new office building. Your TASK is to build an office tower that is as tall as possible made only of straws in a 12" x 12" space and then to present the attributes of the design to an appraiser.

Time

You will have up to 2 minutes to use your IMAGINATION to discuss strategy and up to 5 minutes to build your tower.

Procedure

- Part One (2 minutes): Discuss strategy. During Part One, you may NOT touch any of the straws.
- Part Two (5 minutes): Build your tower within a 12" square and identify its attributes
- Part Three Present the attributes of your tower.

Materials

- 30 Straws in 3 Sizes
- 2 Pair of Scissors
- 2 Toenail Clippers

The scissors and toe-nail clippers may NOT be part of the tower.

Scoring

You will receive:

- A. 2 points (60 points maximum) for each inch (2.5cm) of height of your tower at the end of Part Two.
- B. Up to 20 points for how creatively you attempt to solve the TASK.
- C. Up to 20 points for how well your team works together.

STEM CONCEPTS:

- Structural Engineering
- Architectural Design
- Math
- Creative Expression
- Materials Science
- Communication
- Collaboration
- Critical Thinking
- Problem Solving

YOU BUILD IT, YOU MEASURE IT

Challenge

Your TASK is to build a tower that is as high as possible and then to try to estimate how tall it is.

Time

You will have up to 4 minutes to use your IMAGINATION to build your tower and figure out how you are going to tell how tall the tower is, and then up to 1 minute to tell the Appraisers how tall you think the tower is and why you believe this is the correct height.

Setup

In the middle of the room is a table with materials.

Procedure

- Part One (4 minutes): Use the materials on the table to build a tower that is as high as possible. You may build your tower on the floor or on the table. The tower may not be attached to anything and may only touch the floor or the table. In Part One you should also figure out you are going to tell how tall the tower is. You will be warned when you have 1 minute remaining and when you have 30 seconds remaining in Part One.
- Part Two (1 minute): Tell the Appraisers how tall you think the tower is and why. At the end of Part Two, the Appraisers will measure the height of your tower.

Materials

- | | | |
|------------------|-------------------|-----------------------------------|
| • 1 Paper Cup | • 1 Mailing Label | • 1 Paper Tube |
| • 1 Chopstick | • 1 Craft Stick | • 4 Toothpicks |
| • 1 Plastic Fork | • 1 Straw | • 2 Twist Ties |
| • 1 Rubber Band | • 4 Paper Clips | • 1 Chenille Stick (Pipe Cleaner) |

The mailing label may NOT be attached to the floor or table

Scoring

You will receive:

- Variable points depending upon how closely you guess the tower's height: 20 points if your guess is within 1in (25cm) of the actual height; 10 points if your guess is more than 1in but less than 2in (5.0cm) higher or lower than the actual height.
- 1 point (20 points maximum) for each 2in (5.0cm) of height of your tower at the end of Part Two.
- Up to 20 points for how creatively you figure out the height of the tower.
- Up to 20 points for how creatively you use the materials.
- Up to 20 points for how well your team works together.

STEM CONCEPTS

- | | |
|--------------------------|---------------------|
| • Structural Engineering | • Communication |
| • Architectural Design | • Collaboration |
| • Math | • Critical Thinking |
| • Creative Expression | • Problem Solving |
| • Materials Science | • Measuring |

SPACE STATION

Challenge

Your TASK is to make 2 devices that could be used in a space station, using known and unknown materials, and then to present a PERFORMANCE in which you show how your devices could be used.

For the purpose of this Challenge, a “space station” is a large object that is in orbit around the earth.

Time

You will have up to 5 minutes to use your IMAGINATION to make 2 novel devices using materials and to plan and practice your PERFORMANCE. You then will have up to 2 minutes to present your PERFORMANCE to the Appraisers.

Setup

There is a table with materials.

Procedure

You are on a space station building 2 new devices.

- Part One (2 minutes): Use the materials on the table to make 2 devices that could be used on a space station. Be creative in how you use the new materials
- Part Two (2 minutes): Present a PERFORMANCE in which you show how your devices could be used.

Materials

- 1 Piece of Foil
- 3 Chenille Sticks (Pipe Cleaners)
- 2 Pencils
- 1 Paper Plate
- 4 Toothpicks
- 10in (25cm) of String
- 5 Rubber Bands
- 1 Tube
- 3 Cotton Balls
- 4 Cocktail Umbrellas
- 1 Lei
- 4 Combs

A piece of paper and a sharpened pencil will also be available for your team to use as your plan and present your PERFORMANCE.

Scoring

You will receive up to

- A. 20 points (40 points maximum) for the creativity of each of your devices.
- B. 20 points for how creatively you use the new materials in your devices.
- C. 20 points for the creativity of the PERFORMANCE.
- D. 20 points for how well your team works together.

STEM CONCEPTS

- Materials Science
- Creativity
- Innovation
- Communication
- Collaboration
- Problem Solving

WILL IT STICK?

Challenge

Your TASK is to build a structure that is as tall as possible on a wooden board. The structure needs to stick to the board when the board is turned upside down.

Time

You will have up to 6 minutes to use your IMAGINATION to build your structure.

Setup

You will be provided with a wooden board and materials.

Procedure

6 minutes): Use the materials to build a structure that is as tall as possible and that will stick to the board when the board is turned upside down. You must build your structure on the wooden board. After 6 minutes (or sooner if you want), the Appraisers will measure the height of your structure. You then will have a chance to turn the wooden board with the structure upside down to see if your structure will stick to the board. When turning the board upside down, you only may touch the board. You will receive additional score if nothing falls off your structure for 10 seconds after the board has been turned upside down.

Materials

- 2 Sheets of Paper
- 1 Wooden Board
- 1 Paper Cup
- 5 Paper Clips
- 5 Straws
- (3) 24in (60cm) Pieces of String
- 8 Twist Ties
- 10 Rubber Bands
- 6 Mailing Labels

The mailing labels may NOT be attached to the board. Your team will also have a measuring tape to use but this may NOT be part of your structure.

Scoring

You will receive:

- A. 2 points (40 points maximum) for each inch (2.5cm) of height of your structure at the end of Part One.
- B. 20 points if nothing falls off your structure after the board has been turned upside down for 10 seconds
- C. Up to 20 points for how creatively you use the materials.
- D. Up to 20 points for how well your team works together.

STEM CONCEPTS

- Structural Engineering
- Collaboration
- Architectural Design
- Critical Thinking
- Math
- Problem Solving
- Creative Expression
- Material Science
- Communication

MULTI-TOWERING

Challenge

Your TASK is to build as many free-standing towers at least 12 in (30cm) high using different materials as you can that will hold a balloon on top. For the purpose of this Challenge, "free-standing" means that the tower is NOT attached to anything.

Time

You will have up to 5 minutes to use your IMAGINATION to build your structure.

Procedure

(6 minutes): Use the materials to build as many free-standing towers as you can that are at least 12 in (30cm) tall each with a balloon on top. To receive score, you must move each tower to the 2nd table, where an Appraiser immediately will verify that the tower is at least 12 in (30cm) tall. No team member may be touching a tower when this measurement is made. Only towers that have been moved and measured by the end of the 6 minutes will receive score.

Materials

- 1 Piece of Foil
- 5 Chenille Sticks (Pipe Cleaners)
- 2 Mailing Labels
- 10 Balloons
- 4 Straws
- 3 Rubber Bands
- 3 Paper Clips
- 4 Index Cards
- 2 Pencils
- 2 Pieces of Paper
- 2 Plastic Gloves
- 1 Coffee Cup
- Ruler
- 12in (30cm) Piece of String

-You also will have a ruler, but the ruler may NOT be part of one of your towers.

Scoring

You will receive:

- 10 points (60 points maximum) for each free-standing tower that has been moved to the 2nd table and is at least 12 in (30cm) tall.
- Up to 20 points for how creatively you use the materials.
- Up to 20 points for how well your team works together.

STEM CONCEPTS

- Structural Engineering
- Architectural Design
- Math
- Creative Expression
- Materials Science
- Communication
- Collaboration
- Critical Thinking
- Problem Solving

BRIDGE TO NOWHERE

Challenge

Using the materials provided, build a bridge between two beach balls that will hold weight.

Procedure

Build a bridge between two beach balls with as much span as possible after adding weight. Once you have measured your bridge attach a box of paper clips to the middle of the bridge. You have 2 minutes to plan your structural design – during this period you may NOT touch the materials.

Time

You have 6 minutes to build your bridge and then 1 minute to add the weight.

Materials

- 2 Buckets
- 2 Beach Balls
- 10 Toothpicks
- 1 Box of Paper Clips
- 1 "S" Hook
- 10 Straws
- 3 small rubber bands
- 5 Chenille Stick (pipe cleaner)
- 3 Mailing Labels
- 2 Pieces of Red Paper

Scoring

You will receive:

- A. 1 point for each inch of distance underneath the bridge between the two beach balls.
- B. 10 points if it holds a box of paper clips.
- C. 10 points for creativity and artistic design.
- D. 10 points for teamwork.

STACK 'EM UP

Challenge

Without touching the cups, build a pyramid beginning with a base of 5 cups ending up with one cup (lip up) on top that will hold 3 ping pong balls.

Procedure

Using the materials provided and without touching the cups or the ping pong balls, build a pyramid that has one cup on top that holds 3 ping pong balls.

Time

You have 6 minutes to plan and build your pyramid

Materials

- 15 Cups
- 4 Straws
- 2 Chenille Sticks (pipe cleaners)
- 2 Rubber Bands
- 2 1ft pieces of string
- 3 Ping Pong Balls
- 1 Tube
- 3 Mailing Labels

Scoring

You will receive:

- A. 10 points for teamwork
- B. 10 points if the pyramid is structurally sound.
- C. 10 points if the top cup holds 3 ping pong balls.
- D. 10 points for creativity and artistic design.

KIDS' TV

Challenge

Your team is to present a PERFORMANCE in which you create a new television show for kids.

Time

You will have up to 4 minutes to use your IMAGINATION to create and practice your television show, and then up to 2 minutes to present your PERFORMANCE to the Appraisers.

The Scene

Kids have been watching their favorite television shows for many years. WKDI TV needs a new show for kids and has hired your team. In your television show you will need a main character, as well as a commercial. Be sure to tell the Appraisers the name of your new show before you begin your skit.

Materials

- Markers
- Scissors
- Paper Pencil

The markers and scissors may NOT be damaged and may NOT be used in your skit. A piece of paper and a pencil also will be available for your team to use as you plan and present your PERFORMANCE.

Scoring

You will receive:

- 10 points if your skit contains a commercial.
- Up to 10 points for the creativity of the name of your TV show.
- Up to 20 points for the creativity of your main character.
- Up to 20 points for the creativity of your commercial.
- Up to 20 points for the creativity of your PERFORMANCE.
- Up to 20 points for how well your team works together.

Common Core Standards

Speaking and Listening Standards

- Comprehension and Collaboration
- Initiate and participate effectively in a range of collaborative discussions
- Speaking in respectful ways, listening to others with care, speaking one at a time
- Ask questions to check understanding

Presentation of Knowledge and Ideas

- Conduct research to solve a problem, narrow inquiry, synthesize data, and demonstrate understanding of the subject under investigation.
- Report on a topic, tell a story, or recount an experience.
- Choose words and phrases for effect.
- Choose words and phrases to convey ideas precisely.
- Organize an event sequence that unfolds naturally and logically.
- Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.

Draw, construct, and describe geometrical figures and describe the relationships between them

- Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
- Develop, use, and evaluate probability models.
- Make geometric constructions
- Apply geometric methods to solve design problems, e.g., designing an object or structure to satisfy physical constraints or minimize cost.

Draw and identify lines and angles, and classify shapes by properties of their lines and angles

- Draw points, lines, line segments, rays, angles, and perpendicular and parallel lines.

Geometric measurement Grades

- Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same perimeter and different areas or with the same area and different perimeters. (Grade 3)
- Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
- Solve addition and subtraction problems.

Operations and Algebraic Thinking

- Represent and solve problems involving multiplication and division.

Measurement and Data

- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.