THE FUTURE OF WORK

A DECADE FROM NOW, JOBS WILL NOT LOOK THE SAME. THIS UNCERTAINTY STRESSES THE IMPORTANCE OF INSPIRING, ENGAGING AND PREPARING OUR STUDENTS FOR THE 21ST CENTURY AND BEYOND.

65% of today’s school kids will end up doing jobs that haven’t even been invented yet. – U.S. Department of Labor

15.7 Million
new project management roles will be created by 2020—with no one available to fill them.
– The Project Management Institute

1 Million
It is estimated that 1 million computer science jobs will go unfilled in 2020.
– Code.org

123 Million
The demand for highly-skilled workers will hit 123 million by 2020, but there will only be 50 million qualified people to fill these jobs.
– AT&T

7.7 Million
climate and energy jobs will be available by 2020.
– Renewables 2015 Global Status Report

50 Billion
people, devices and things will be connected to the Internet by 2020.
– Cisco

60% of CEOs polled cited creativity as the most important leadership quality, compared with 52% for integrity and 35% for global thinking.
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We are at a transformative point in history. Innovation is now driving the global economy and challenging the status quo. Advancements in online learning, chemistry, data applications, smart devices, computer science, video and photo usage, broadband platforms, avionics and aeronautics, nanoscale technology, and mobility are disrupting every industry and influencing user behavior.

In a recent survey by the AACU, 93% of employers (non-profit and for-profit) reported that thinking, complex problem solving, and communication were more important than a candidates’ underlying major. In another survey, researchers learned that student interest was the highest-related influence in choosing to pursue a field of study; however, they had to have knowledge of this field.

Destination Imagination (DI) and Space Camp® have formed a unique joint venture designed to complement what students are learning in school by providing fun and engaging project-based challenges that invoke curiosity and teach the creative process. The world is changing rapidly and we must alert students to the myriad of new and exciting opportunities that will require the 21st century skills of creativity, critical thinking, collaboration and communication.

Through our partnership with Space Camp® and the creation of this Education Guide, DI aims to provide useful tools and knowledge that can help educators around the globe create unique 21st century learning opportunities for students everywhere. Join with us to inspire, engage and equip students with the skills and abilities that will prepare them for a world characterized by innovation.

The person who will first set foot on Mars has already been born. As the world’s scientists and engineers develop the technologies to get us to the Red Planet, the U.S. Space & Rocket Center’s Space Camp® is training the explorers who will go. Through immersive technology and experiential learning, trainees go beyond conventional solutions to accomplish their mission.

“Hands-on education” and “problem-based learning” are more than just buzzwords. By partnering with Destination Imagination, Space Camp is inspiring teachers and students to adopt a new paradigm of innovation, engagement and cooperation. We offer creative and exciting new activities, along with first-class, standards-based resources that infuse adventure and insight into what students are learning in the classroom.

Through our new partnership, Destination Imagination and Space Camp are committed to developing the skills and the confidence students need to excel in the 21st century workforce. This education guide is just the first step in our journey to inspire The Mars Generation – come travel with us.

Dr. Deborah Barnhart
CEO and Executive Director
U.S. Space & Rocket Center
THE CREATIVE PROCESS

Recognize
Becoming aware of the Challenge
Gaining an in-depth understanding of the Challenge

Imagine
Generating ideas with team members
Focusing on promising ideas
Creating a project timeline

Initiate & Collaborate
Researching, exploring and experimenting
Committing to options
Building and completing all requirements

Assess
Assessing progress
Reworking or reimagining ideas
Practicing presenting the solution

Evaluate & Celebrate
Presenting a project or Challenge solution
Reflecting on and celebrating the experience

DESTINATION IMAGINATION USES A UNIQUE SYSTEM OF LEARNING CALLED THE CREATIVE PROCESS.

Each stage of the creative process serves an important role in successfully solving any Challenge or project. The creative process integrates Bloom’s Taxonomy, the scientific method, 21st century skills, collaborative problem solving, and the stages of practical inquiry and whole child education. Check out pages 19-23 for some sample creative process tools.
About the Guide

The Destination Imagination (DI) Education Guide is a resource developed for educators to encourage and support the infusion of 21st century learning strategies into all areas of educational content. The mission of DI is to develop opportunities that inspire the global community of educators and learners to utilize diverse approaches in applying 21st century skills and creativity. The core teaching strategies of Destination Imagination programs center around the creative process (seen to the left), which utilizes a unique system of learning that is applicable to solving all types of problems, challenges and projects throughout life.

DI recognizes and applauds educators around the world who are working enthusiastically to provide students the knowledge and skills that they need to face the new human and digital eco-culture; however, the exponential growth in new technologies and the global economy is outpacing K-12 education. DI supports and assists educators worldwide in bridging the widening gap between the classroom and the real world, making students aware and ready. Throughout this guide are examples of activities designed to assist educators in their journey to inspire, engage, and prepare students for the ever-changing world of the 21st century and beyond.

Educational Goals

- Complement K-12 education by fostering curiosity, courage and creativity through innovative 21st century programming and teaching
- Support educators through fun and engaging professional development activities
- Provide awareness of STEAM (science, technology, engineering, arts and mathematics) and leadership trends in education and the global marketplace
- Contribute and reinforce expertise in project and challenge-based learning

STEAM Classroom Activities

This section of the guide provides nine fun and engaging STEAM activities, which can be done with teams of students, as well as the necessary information to facilitate them. In addition, a tool is provided called the Challenge Activity Generator that can be used to create over 1,000 fun classroom activities of different types. All of these activities will help students to improve their mental agility, intuition, creativity and critical thinking skills.

Creative Process Skills Toolbox

Pages 19-23

The DI Challenge Program uses a guide called Roadmap to assist our educators in facilitating a team through the creative process. In this section, some of our favorite tools from Roadmap have been chosen as a sample to introduce the process. These tools can be applied to any teaching content to help students develop skills in novelty, creativity and critical thinking, project management, conflict resolution and perseverance.

DI and Space Camp

Program Information

Pages 24-30

Head to this section of the guide for more information on both Destination Imagination and Space Camp programs, which students and educators can participate in to further their knowledge of innovation, creativity and 21st century learning.
INTRODUCTION TO STUDENT ACTIVITIES IN STEAM AND 21ST CENTURY LEARNING

Challenge Activity Learning Objectives

- Expert Intuition
- Mindfulness
- Creativity
- A Completion Mindset
- Rapid Prototyping
- Communication
- Collaboration
- Conflict Management
- STEAM Concepts
- Project Management Skills

What are Destination Imagination® Classroom Activities?

The enclosed Classroom Activities (Challenges) have been developed by Destination Imagination, Inc. as part of our Destination Imagination school/community-based program. The nine introductory Challenges have come from writers in industry and education, and incorporate components of STEAM (science, technology, engineering, arts and math), which align with the 21st century skills framework (see P21.org.)

Each of the Classroom Activities requires students to engage in collaboration, communication, creativity and critical thinking. During a Challenge, students 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—usually 10 minutes or less. These Challenges easily fit into any class schedule and are applicable to a wide variety of content and curriculum.

The Challenges included in this guide are task and outcome-based and several of them include a performance aspect. A Task-Based challenge will often require some readily available supplies and the participants will be asked to create a tangible solution. Performance-Based Challenges require the participants to devise a presentation aspect that enhances their tangible solution and engages different skills.

How does it work?

Students will collaborate and work together on any given Classroom Activity. The educator or facilitator 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 educator or 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 a tangible solution from the materials provided.

Remember, there are many possible solutions 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 students. Switch team member roles 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 their experience. The educator’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 Classroom Activities are written so both the educator and the students can benefit from Processing Questions. Below are some examples questions:

Questions for the students might be:
- What was fun about this challenge?
- Would you change anything you did?
- What new things did you learn?
- How well did your team work together?

Questions for the educators might be:
- What was enjoyable about the task for the group? Why?
- How did the participants interact with each other and the task? Was the interaction positive or negative?
- What changes could be made to improve the Challenge 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 enjoy and learn from the challenges! Each activity includes a scoring procedure, which will allow the educator to turn the challenge into a competition. The Activities are designed to engage student participants, no matter what their age or ability level, and everyone can have fun and learn critical life skills through the creative process!

Educator Outcomes
- Skills Development: 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, inferencing, elaboration
- 21st Century Skills: 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 affirmation
- Identification of student strengths

Materials List (materials can be substituted as necessary):
- 2 Balloons
- 2 Beach Balls
- 1 Bucket
- 4 Cocktail Umbrellas
- 4 Combs
- 3 Cotton Balls
- 2 Pieces Foil
- 4 Index Cards
- 1 Lei
- 15 Mailing Labels
- 1 Box of Markers
- 2 Nail Clippers
- 1 Large Sheet of Paper or Cardboard
- 8 Paper Clips
- 1 Box of Paper Clips
- 3 Paper Cups
- 1 Paper Plate
- 2 Paper Towel Tubes
- 6 Pencils
- 3 Ping Pong Balls
- 15 Pipe Cleaners
- 15 Plastic Cups
- 1 Plastic Fork
- 2 Plastic Gloves
- 25 Rubber Bands
- 1 Ruler
- 2 Scissors
- 10 Sheets of Paper (8.5”x11”)
- 20 Sticky Dots
- 50 Straws
- (10) 12” Pieces of String
- 15 Toothpicks
- 10 Twist Ties
- 1 Wooden Board (see challenge for size)
SPACE STATION

21st Century and STEAM Learning Concepts
- Materials Science
- Novelty
- Creativity
- Innovation
- Performance Arts and Presentation
- Communication
- Collaboration
- Problem Solving

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. There is no gravity and space is small and confined.

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

Setup
There is a table with materials for your team to use in solving this Challenge.

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. Up to 20 points for how creatively you use the new materials in your devices.
C. Up to 20 points for the creativity of the PERFORMANCE.
D. Up to 20 points for how well your team works together.
JUST STRAWS

21st Century and STEAM Learning Concepts

- Structural Engineering
- Architectural Design
- Mathematical Theory
- Creative Expression
- Materials Science

Challenge
Your Architectural Team has been asked to build a scale model of a new office building for presentation. 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.

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 Nail 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.
YOU BUILD IT, YOU MEASURE IT

21st Century and STEAM Learning Concepts
- Structural Engineering
- Architectural Design
- Mathematical Theory
- Creative Expression
- Materials Science
- Communication
- Collaboration
- Critical Thinking
- Problem Solving
- Geometrical Measurement

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 tall the tower is, and then up to 1 minute to report 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): Report how tall you think the tower is and why. At the end of Part Two, your tower will be measured for height and compared to your estimate.

Materials
- 1 Paper Cup
- 1 Pencil
- 1 Plastic Fork
- 1 Rubber Band
- 2 Mailing Labels

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

Scoring
You will receive:
A. Variable points depending upon how closely you guess the tower’s height: 20 points if your guess in 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.
B. 1 point (20 points maximum) for each 2in (5.0cm) of height of your tower at the end of Part Two.
C. Up to 20 points for how creatively you figure out the height of the tower.
D. Up to 20 points for how creatively you use the materials.
E. Up to 20 points for how well your team works together.
NEW CONSTELLATIONS

21st Century and STEAM Learning Concepts

- Creativity
- Critical Thinking
- Imagination
- Communication
- Collaboration
- Novelty
- Artistic Expression
- Performance Arts
- Creative Expression

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 performance.

The Scene

In the center of the room is a large piece of paper. By placing sticky dots on the paper and connecting them, a constellation can be created.

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

Materials

- Large sheet of paper or cardboard
- Markers
- 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.
WILL IT STICK?

21st Century and STEAM Learning Concepts

- Structural Engineering
- Collaboration
- Architectural Design
- Critical Thinking
- Mathematical Theory
- Problem Solving
- Creative Expression
- Material Science

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
You will have up to 6 minutes to 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), the height of the structure will be measured. 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 may only 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.
MULTI-TOWERING

21st Century and STEAM Learning Concepts

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

Challenge

Your TASK is to build as many freestanding towers, at least 12 in (30cm) high, using as many different materials as you can that will hold a balloon on top. For the purpose of this Challenge, “freestanding” 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 it will immediately be verified as being 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

Scoring

You will receive:

A. 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.

B. Up to 20 points for how creatively you use the materials.

C. Up to 20 points for how well your team works together.
BRIDGE TO NOWHERE

21st Century and STEAM Learning Concepts
- Structural Engineering
- Architectural Design
- Mathematical Theory
- Materials Science
- Novelty
- Rapid Prototyping
- Geometric Measuring
- Project Planning
- Creativity
- Collaboration

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

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

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. Up to 10 points for creativity and artistic design.
D. Up to 10 points for teamwork.
STACK ‘EM UP

21st Century and STEAM Learning Concepts
- Communication
- Collaboration
- Critical Thinking
- Problem Solving
- Teamwork
- Materials Science
- Creativity
- Completion Mindset
- Innovation

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.

Time
You have 6 minutes to plan and build your pyramid.

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.

Materials
- 15 Cups
- 4 Straws
- 2 Pipe Cleaners
- 2 Rubber Bands
- 2 1ft pieces of string
- 3 Ping-Pong Balls
- 1 Tube
- 3 Mailing Labels

Scoring
You will receive:
A. Up to 10 points for teamwork
B. 10 points if the pyramid is structurally sound.
C. Up to 10 points if the top cup holds 3 Ping-Pong balls.
D. Up to 10 points for creativity and artistic design.
KIDS’ TV

21st Century and STEAM Learning Concepts
- Performance Arts
- Creative Expression
- Communication
- Collaboration
- Idea Generation
- Idea Processing
- Creativity
- Novelty

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.

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 announce 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:
A. 10 points if your skit contains a commercial.
B. Up to 10 points for the creativity of the name of your TV show for kids.
C. Up to 20 points for the creativity of your main character.
D. Up to 20 points for the creativity of your commercial.
E. Up to 20 points for the creativity of your PERFORMANCE.
F. Up to 20 points for how well your team works together.
COMMON CORE AND STATE 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.
Add some creativity, teamwork, and excitement to your classroom, dinner table, or next meeting with this great Challenge generating tool! Gather all of the materials in Column A, then choose one of the three types of Challenges below and follow the instructions.

**Performance-Based Challenge**
Randomly choose one or more items from A and one item from D and E and put on a show.

**Task-Based Challenge**
Randomly choose one or more items from A and one item from B and C and make it happen.

**Combination Challenge**
Randomly choose one or more items from A and one or more items from B, C, D or E and get busy.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal Box</td>
<td>Cosmetic Item</td>
<td>Move</td>
<td>Cave</td>
<td>Talking to the Fish</td>
</tr>
<tr>
<td>Newspaper</td>
<td>Vehicle</td>
<td>Make a Job Easier</td>
<td>The Moon</td>
<td>Late!</td>
</tr>
<tr>
<td>Deck of Cards</td>
<td>Aircraft</td>
<td>Keep Us Healthy</td>
<td>Rainforest</td>
<td>Lost All of Your Money</td>
</tr>
<tr>
<td>Linguini</td>
<td>Cleaning Tool</td>
<td>Make People Laugh</td>
<td>Tree House</td>
<td>Making a Fancy Meal</td>
</tr>
<tr>
<td>Cotton Balls</td>
<td>Sculpture</td>
<td>Cool People Off</td>
<td>Jungle</td>
<td>Cleaning the Kitchen</td>
</tr>
<tr>
<td>Cotton Swabs</td>
<td>Game</td>
<td>Signal</td>
<td>Under the Ocean</td>
<td>Trying to Fly</td>
</tr>
<tr>
<td>Aluminum Foil</td>
<td>Structure</td>
<td>Hold a Tennis Ball</td>
<td>Amusement Park</td>
<td>A Really Wet Day</td>
</tr>
<tr>
<td>Poster Board</td>
<td>Shelter</td>
<td>Protect</td>
<td>Antarctica</td>
<td>Lost Your Notebook</td>
</tr>
<tr>
<td>Straws</td>
<td>Container</td>
<td>Make Noise</td>
<td>Concert</td>
<td>Are Very, Very Hungry</td>
</tr>
<tr>
<td>Paper Plate</td>
<td>Kitchen Tool</td>
<td>Hit a Target</td>
<td>Storybook Land</td>
<td>Playing a New Game</td>
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</tbody>
</table>
SKILLS TOOLBOX

IMAGINE: IDEA GENERATING

ABC Brainstorming

“ABC Brainstorming” is a thinking tool that can help individuals or teams generate ideas. By forcing teams to think differently than they would if thinking freely, thinking tools can help your team discover options they might not have generated, or select ideas they might not have considered.

In this ABC Brainstorming session, have the team draw the grid below on a blackboard, whiteboard or a flip chart. Then generate ideas that start with each letter. Try to address a simple problem, one to which the team is not particularly attached, so the team can work for fluency of ideas. For example, what are different functions that a chair might serve? How about a ballpoint pen? Strive for as many ideas as possible, and try to fill in every letter.

Educator/Facilitator Tip: When your team is more comfortable with the technique, they can use this tool to generate ideas for real-world projects and challenges.

<table>
<thead>
<tr>
<th>Letter</th>
<th>Idea</th>
<th>Letter</th>
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</table>
INITIATE AND COLLABORATE: IDEA PROCESSING

CHOICE HELPER

One way the team can choose ideas is by using “Choice Helper.” This activity is designed to help a team assess ideas, after they have been generated, according to factors the team members consider important. For this activity, form teams and provide each team member with a few pieces of paper. Choice Helper allows a team to narrow its choices and to evaluate options in an orderly manner while utilizing critical thinking skills.

1. To use the matrix, the team first lists ideas down the left side of the matrix. For example, if a team has five different options for a community service project to complete, it would list the five options on the left side of the matrix.
2. Then the team lists criteria across the top of the matrix that are important in choosing the best ideas. Using the same example, the team might decide that low cost, easily available materials, needed skills, execution time and uniqueness are the criteria it will use to judge each service project. (Use these criteria, or have the teams make up their own.)
3. The team then assigns a ranking scale with which they can assess each option for each criterion (e.g., 1=fair, 3=average, 5=great).
4. Each team member should be given his or her own sheet of paper and writing utensil to rank each option.
5. Then the team should consider each idea, one at a time. Each team member will work down each column to rank each option for the same criterion. Then they should go to the next criterion. (Doing it this way will reduce the possibility that a team member will be affected by how others ranked criteria.)
6. When each team member has ranked the options for each criterion, the points are averaged. The results can direct the team’s discussion until they can come to an orderly and well-considered decision.

<table>
<thead>
<tr>
<th>Option</th>
<th>Criterion 1</th>
<th>Criterion 2</th>
<th>Criterion 3</th>
<th>Criterion 4</th>
<th>Criterion 5</th>
<th>Average</th>
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Make sure the team understands how to use this tool, and also encourage them to return to the tool in the future. How can the team use this tool for its Future project or Challenge solutions?
PROJECT MANAGEMENT

The Project Management Institute Educational Foundation (PMIEF) is working with Destination Imagination to give students the tools and skills that will help them solve real-world projects and challenges now and also help them handle any school or future work projects. These tools will also help educators and facilitators to encourage efficient teams and keep them on track. There are four steps (or Process Groups in PMI language) to successfully managing a project. This guide uses age-appropriate language to describe the steps, but will also list official terms used by the Project Management Institute (PMI) in parenthesis to familiarize you and your team with the official PMI language.

FOUR STEPS TO SUCCESSFULLY MANAGING A PROJECT:

DEFINE (INITIATING):
This step is related to the Recognize Stage of the creative process. During this step, your group or team will work to determine team guidelines and expected behaviors, think about and choose a project or challenge, understand all elements of the project or challenge, set goals for the overall project, determine meeting schedules, begin to learn to work together, and start to explore the roles and behaviors that are necessary for team success.

PLAN (PLANNING):
During the Plan step, your team members will use their imaginations (the Imagine Stage of the creative process) to identify the tasks and mini-projects that need to be completed to successfully complete their project or challenge. Once the team has a good understanding of the project or challenge, they will be able to see how many tasks and mini-projects they need to undertake to successfully complete the project or challenge. The team can use this process for each element of the project or challenge. Once a plan is in place, the team will move to the Do step of Project Management.

Educator/Facilitator Note: You may find, especially with younger teams, that your team might do better to plan one part of the project or challenge, move to the Do and Review steps, and finish that task before planning the next one. Planning the entire solution can take a lot of time and patience; some teams might need to take action on smaller projects to keep feeling motivated about their solution.

DO (EXECUTING AND MONITORING & CONTROLLING):
During the Do step, teams will use the Initiate and Collaborate Stage of the creative process. Your team will spend most of its time in this step of Project Management. Team members will use the team-generated requirements from the Plan step and bring those ideas to life.

REVIEW (CLOSING):
As the team members work on their tasks and projects, they will check their work against their original plans (the Assess Stage of the creative process). Does the work meet the requirements of their Challenge and the requirements defined by the team in the Plan step? If it doesn’t, the team should meet to discuss potential solutions or even decide to start over.

Educator/Facilitator Note: As the team members work on creating their solutions, they may find their initial ideas are more difficult than they realized. You can encourage them to keep working to create the team’s original plan. Don’t let the team give up because the task is difficult; remind them that they CAN do it. If, after trying many ideas, the team members working on the task or mini-project feel that they can’t meet the original requirements planned by the team, have them meet with the entire team to re-plan the task.
TEAM OR GROUP PROJECT PLAN

DEFINE

Below is a useful tool that was developed by the Project Management Institute Educational Foundation. It has been reproduced here for your group or team to use in the development of a project or challenge solution. This tool can be used to define the plan for the overall production of the project or challenge solution, and it can also be used to define what is needed for the development of individual components of the project or challenge.

If you would like to download and use more PMIEF tools, visit the website below and click on “Toolkit Materials.” http://pmief.org/learning-resources/learning-resources-library/project-management-toolkit-for-teachers

PROJECT NAME (GROUP OR TEAM PROJECT TITLE):

A. Goals
   1. Goals explain what will be achieved by the end of the project.
   2. What is the question, problem, issue or perspective that is driving your project?
   3. What is your goal?

B. Resources, Constraints, and Assumptions
   1. Resources are all of the things that can be applied to help the project, which may include money, people’s time, things you can trade for, or goods and services you own or can get for free. Name and describe the resources you have available.
   2. Constraints are defined as things that limit what you can do in some way. Name and describe the constraints your project will have.
   3. Assumptions are the things you know to be true about the project. What assumptions can you make as you begin your project?

C. Scope
   1. Defining the scope determines what the project will and will not do; it establishes boundaries.
   2. Things that are within the scope of the project (be sure to include the final presentation of results as part of your scope statement).
   3. Things that are not within the scope of the project.

D. Deliverables and Dependencies
   1. Deliverables: The products or results that are created through the course of the project, leading to the goal. In some cases, the goal and deliverable will be the same.
   2. Dependencies: The relationships between the deliverables.

(Note: some projects may have only one deliverable and, therefore, no dependencies.)
FILL IN THE CHART BELOW TO INDICATE THE FOLLOWING:

- When the project is complete, what will your deliverables be?
- When you are working on the deliverables, what will their dependencies be?

<table>
<thead>
<tr>
<th>#</th>
<th>DELIVERABLES</th>
<th>DEPENDENCIES</th>
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**Establish Project Managers**

Identifying project managers will help you manage all the parts of your project. Team members assigned to work as managers will have specific roles helping monitor and manage the project. The Project Manager will be responsible for making sure the project or challenge solution remains within the stated scope and give project updates to the rest of the team. The Time Manager will be responsible for helping each team member remain on track and on schedule.

The Quality & Risk Manager will be responsible for helping team members identify possible challenges or stumbling blocks, and getting the supplies or other resources needed to help individual team members produce their deliverables or solutions with high quality. This team member will be responsible for making sure that the team is aware of all the potential risks associated with completing the project or challenge solution. Some possible risks include: going over the stated budget for the chosen project or challenge, taking longer to complete the project or challenge than the initial timeline, or not completing the project or challenge within the original scope of the work.

The Communication Manager will be responsible for keeping track of the project materials and ensuring that the group or team members are communicating with each other.

**WHO ON YOUR TEAM WILL FILL EACH OF THESE ROLES?**

Project Manager:

Time Manager:

Quality  &  Risk Manager:

Communications Manager:
Destination Imagination (DI) is a project-based educational program that inspires and equips students to become the next generation of innovators and leaders. Teams in our program improve in creative thinking, critical thinking and collaborative problem solving. Our participants experience the creative process, develop new friendships and learn to work together.

- Annually, DI offers new standards-based Challenges in 7 areas.
- Each Challenge is open-ended and enables student teams to learn and experience the creative process.
- Up to 7 members can be on a team, and students from kindergarten through university level participate.
- Each team needs an adult Team Manager. Team Managers help students stay on track but do not directly help the team develop its solution to the DI Challenge.

Learning Objectives
Science, Technology, Engineering, Design, Arts, Mathematics, Creativity, Innovation, Critical Thinking, Problem Solving, Communication & Collaboration

Seven Challenges
Challenges in seven areas: Technical, Scientific, Structural, Fine Arts, Improvisational, Service Learning and Early Learning.

Proven Results
“DI taught me how to think creatively. As a scientist, I think differently than other people, and it is certainly an advantage.”
– Lauren Zarzar, Ph.D., Harvard Graduate
DI is all about the experience. It’s about teamwork, collaboration and learning how to think creatively and critically. All of those things are where the real learning happens.”
- Gerald Fussell, Principal

DI provides opportunities for our children to think, take risks and work together to solve common problems that will get them to rule the world.”
- Raymond Simon – Deputy Secretary, United States Department of Education

I have seen amazing growth in self-confidence, self-assurance and the ability of students to enjoy their own ability of creating ideas. DI participants know that no challenge is too difficult to solve and are not afraid to try over and over again.”
- Kim Bejot, Educator

The students of today are going to have multiple careers, and so the skill sets they need are much different. It’s not just about memorization and knowledge. It’s about teamwork, learning and DI’s principles: collaboration, critical thinking and problem solving.”
- D.R. Widder – Executive Director of Innovation, Philadelphia University

DI is where you learn all the elements that school does not teach you; life skills that will benefit any human being for the rest of their life.”
- Marshall Rainey, DI Alum

DI taught me how to think creatively. As a scientist, I think differently than other people, and it is certainly an advantage.”
- Lauren Zarzar, Ph.D., Harvard Graduate

EDUCATORS USE DI TO PROVIDE A MORE COMPLETE EDUCATIONAL EXPERIENCE

OUR PARTNERS HELP US FOSTER THE NEXT GENERATION OF INNOVATORS AND LEADERS

“Kids are our hope for creatively solving all of the problems that our planet faces. Nat Geo wants to excite people to get out and explore and DI wants to excite kids to solve problems. Put those two things together and we have an amazing world.”
- Marina Bellows, National Geographic

Organizations like DI are teaching tomorrow’s workforce that careers in engineering and technology are not only fun, but also within their reach.”
- Matt Blakely, Motorola Solutions Foundation

If each and every student had opportunities such as these made possible through DI, our children would undoubtedly be future-ready!”
- Helen Soule, Partnership for 21st Century Learning

These students will be the ones that take the rockets NASA is working on now to destinations unknown.”
- Tammy Rowan, NASA

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**DI TERMINOLOGY**

**TEAM MANAGER:** The person in charge of meetings, planning, team registration, tournament logistics and team safety. Team Manager must be 18 years of age or older.

**AFFILIATE:** An organization licensed by Destination Imagination, Inc. (DII) and administrator of the Challenge Program in a specific geographic area.

**TEAM NUMBER:** A Team Number entitles a given team to participate in a DI Team Challenge at any level. Each team must have a distinct Team Number, which is provided upon purchase.

**TOURNAMENT:** A celebration of creativity where teams have the opportunity to compete and showcase their Team Challenge solutions and complete an Instant Challenge.

**INSTANT CHALLENGE:** A component of Destination Imagination in which team members must think quickly and apply appropriate skills to produce a solution to an Instant Challenge in a period of just 5 to 8 minutes.

**TEAM CHALLENGE:** A component of Destination Imagination that involves a Challenge with multiple requirements that your team works together over an extended period of time to solve.
1 **FORM A TEAM**

1 ADULT TEAM MANAGER + 2 TO 7 TEAM MEMBERS = DESTINATION IMAGINATION TEAM

The adult Team Manager must be 18 years of age or older.

**RISING STARS!**: Preschool-2nd Grade

**ELEMENTARY LEVEL (EL)**: Kindergarten-5th Grade

**MIDDLE LEVEL (ML)**: 6th-8th Grade

**SECONDARY LEVEL (SL)**: 9th-12th Grade

**COLLEGE & UNIVERSITY LEVEL**: Full-time, post-secondary students enrolled in college, university, trade, or technical school or military college-bound. High school seniors who are taking accredited courses offered by a college or university that will qualify for course credit when entering higher education.

2 **PURCHASE A TEAM NUMBER**

Register through ShopDI.org, or download the Start a Team Application at DestinationImagination.org, fill out and fax, mail or email it to us at AskDI@dihq.org. Visit DestinationImagination.org/TeamPricing for pricing information. After purchasing the first Team Number, organizations can purchase additional Team Numbers at a discounted price. *Depending on the state or country in which you reside, you may be required to pay additional Affiliate fees.

3 **REGISTER YOUR TEAM**

Registering with your state or country organization will allow your team to attend a local tournament and possibly qualify to attend Global Finals. If you purchase a Team Number online, you will be prompted to select your Affiliate (state or country). If filling out the downloadable form, choose your Affiliate.

4 **CHOOSE YOUR CHALLENGE**

You will receive a hard copy of our Program Materials by mail (if in the US, Canada or Mexico) or you can download the files online. After you review the materials, decide which Challenge is the best fit for your team. Your Challenge solution should take 6-12 weeks. Start by meeting for 1-2 hour sessions.

5 **ATTEND A TOURNAMENT**

Most Regional and Affiliate Tournaments occur between February and April. If you qualify at the Affiliate level, you advance to Global Finals.
JOURNEY TO THE FUTURE
Space Camp and Space Academy programs are moving forward with NASA into deep space exploration. The Mission Center Complex where Space Camp students of all ages train has all new Mars, lunar and asteroid missions as well as a new SLS Orion, and in 2016, a Starliner and Dragon spacecraft. Our NASA grant-funded ISS: Science on Orbit exhibit gives trainees a true sense of what it’s like to live and work in space.

LEARN MORE 1.800.637.7223

ASTRONAUT SPEAKERS EVERY WEEK IN THE SUMMER!

Robert “Hoot” Gibson,
five-time Shuttle astronaut

Dottie Metcalf-Lindenburger
First Space Camp graduate in space
STS-131 Discovery

Samantha Cristoforetti
ISS Expedition 42/43

Dr. Kate Rubins
ISS Expedition 48/49

Dr. Serena Aunón
NEEMO 16

Christina Hammock
NASA Astronaut Group 21

FIVE SPACECAMP ASTRONAUT ALUMNAE

Communications
Engineering
Healthcare
Information Technology
Legal Services
Military
Government
Leisure Hospitality

Student Science Research

Computer Science

88%
Percentage of Space Camp graduates who took more STEM classes after attending camp

71%
Percentage of Space Camp graduates that chose a career field related to aerospace, technology, energy, defense, or biotechnology

66%
Percentage of Space Camp graduates who said their camp experience inspired their decision to enter a STEM field

Word cloud represents frequency of career fields chosen by Space Camp alumni who participated in a February 2013 online survey. Size of the word is proportional to the percentage of alumni who were currently working in that career field.
MEET OUR SPACE CAMP ALUMNI

“Space Academy changed my life forever, personally and professionally. I saw real-world examples of how math and science should be integrated together and in a fun way that made sense. The engineering design challenges and rocketry lessons at Camp were phenomenal. I found myself wondering ‘where has this been all my life?’ I was having so much fun and learning as an adult that I couldn’t wait to get back and implement these projects with my students.

I revamped the entire way I taught. Everything became hands-on, and I integrated space content into all the topics that I taught. Reading, writing, research and math were all integrated into projects as well. My students were more engaged, I had higher attendance numbers and I was having a blast, too!”

– Kaci Heins

Attended Camp: 2010 as a part of Honeywell’s Educators @ Space Academy
2012 with Honeywell’s Advanced Space Academy
2015 as a Honeywell Ambassador for Honeywell’s Educators @ Space Academy
2015 Family Space Camp with 7-year-old son

Education: Bachelor’s Degree in Elementary Education with an emphasis on science, Southeast Missouri State University
Master’s Degree in Secondary Education with an emphasis in technology, Southeast Missouri State University

Occupation: Sixth-grade science teacher

“I began my six years at Space Camp by first attending Aviation Challenge because I thought I wanted to be a pilot. I had a great time at Aviation Challenge, but when I heard former NASA astronaut Don Thomas talk at graduation, his story inspired me to try Space Camp. I went on to attend Space Camp multiple times and it became like a second home to me. What I learned about space exploration sparked my desire to research all I could on the subject. My time at Space Camp also kept me interested in science in school, and I took as many courses in engineering and science as I could. I also used what I learned about the International Space Station to design a tool that won the Future Engineers 3-D Printing in Space Tool Challenge, and my winning design will be printed aboard the ISS. I’m now pursuing a degree in aerospace engineering and want to go on to work for NASA and eventually to become an astronaut.”

– RJ Hillan

Education: Freshman at University of Alabama in Huntsville, Aerospace Engineering

Awards: Won the Future Engineers 3-D Printing in Space Tool Challenge
**Space Camp® Programs for Students**

Space Camp inspires the next generation of explorers with an impactful, fully-immersive experience in informal STEM education.

Two-day, three-day and weeklong camp programs available for classroom groups. Missions are centered around trips to Mars, the ISS and the moon aboard NASA vehicles including the Orion capsule, Altair Lander and Space Launch System.

Space Camp has nearly 700,000 alumni worldwide, including the first Italian woman in space – astronaut Samantha Cristoforetti – and astronaut Dr. Kate Rubins, selected to fly on ISS Expedition 48/49 in May 2016.

Inspire the great minds of tomorrow with a trip to Space Camp!

Call **1-800-637-7223** or visit [www.spacecamp.com](http://www.spacecamp.com) to reserve your spot today.

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**Space Academy® for Educators**

Step out of the box and into mission training to learn methods for delivering the excitement of space exploration in your classroom with Space Academy for Educators.

The weeklong program is offered June through August and includes authentic astronaut training simulations and activities developed to promote learning in a classroom setting. Curriculum includes NASA content and is correlated to the National Science Education Standards.

Trainees in Space Academy for Educators earn 45 hours of continuing education credit and educators get access to their own website with lesson plans, standards and tips needed to adapt many of the workshop activities to individual class environments.

Call **1-800-637-7223** for information today!
The mission of Share Fair Nation is to teach and inspire educators in emerging practices for a 21st century workforce.

For information on upcoming events log in to WWW.SHAREFAIRNATION.ORG

Follow us on social media at: @ShareFairNation • Facebook.com/ShareFairNation
EVERY YEAR, WE IMPACT MORE THAN 150,000 STUDENTS IN 48 STATES AND 30 COUNTRIES

7 Challenges

- Technical
- Scientific
- Engineering
- Fine Arts
- Improv
- Service Learning
- Early Learning

1,500,000+ Alumni

150,000 Participants Annually

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38,000+ Volunteers

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