



# TRY DI

## IC Challenge Types Sampler

### **Bullseye**

(Technical)

### **Rain, Rain, Go Away**

(Engineering)

### **Friends Forever**

(Scientific)

### **Written All Over Your Face**

(Fine Arts)

### **Human Scenery**

(Improvitational)

### **Great Minds Helping Others**

(Service Learning)

Instant Challenges written by  
DI Colorado Alumni Madison Brette Basinger  
and revised by  
DI New Hampshire Alumni Noam Eshed  
And  
DI Georgia Regional Director Annette Rogers

## TEAM COPY

# BULLSEYE

(Technical)

### Challenge

Your TASK is to build a device or devices that will allow your team to manipulate a marble that is in a box to go into the bullseye (that is also in the box) and stay there for a specified amount of time. Team members may initially set up their devices. Once set up, only the devices may touch the box to manipulate the marble.

### Time

You will have up to 6 minutes to build your device or devices. You will use your device or devices to manipulate the marble to go and stay in the bullseye. You may practice during this time. You will then have one minute to manipulate the marble to go and stay in the bullseye for a specified amount of time.

### Setup

In the center of the room is a table with materials which you may use to build your devices. The table also holds the box that contains the marble and bullseye.

### Procedure

#### Part One (6 minutes)

Use the materials available to build a device or devices that you will use to manipulate the marble to go and stay in the bulls-eye.

#### Part Two

You will have 15 seconds to set up your device or devices.

You will then have up to one minute to manipulate the marble within the box, to go and stay as close to the center of the bullseye, for a specified amount of time.

### Scoring

20 points for being able to manipulate the marble into the bullseye with your device or devices

10 points if the marble remains in the bullseye (1-4) for 20 seconds

20 points if the marble remains in the bullseye (2-4) for 20 seconds

30 points if the marble remains in the bullseye (3-4) for 20 seconds

40 points if the marble remains in the bullseye (4-4) for 20 seconds

Up to 20 points for the creative use of the materials

Up to 20 points for teamwork

# **BULLSEYE**

## **Materials**

3 clothes pins

8 pipe cleaners

4 rubber bands

3 plastic spoons

12-inch piece of string

Pair of Chopsticks

2 ping pong balls

# **BULLSEYE**

**(Technical)**

## **Challenge**

Your TASK is to build a device or devices that will allow your team to manipulate a marble that is in a box to go into the bullseye (that is also in the box) and stay there for a specified amount of time. Team members may initially set up their devices. Once set up, only the devices may touch the box to manipulate the marble.

## **Time**

You will have up to 6 minutes to build your device or devices. You will use your device or devices to manipulate the marble to go and stay in the bullseye. You may practice during this time. You will then have one minute to manipulate the marble to go and stay in the bullseye for a specified amount of time.

## **Setup**

In the center of the room is a table with materials which you may use to build your devices. The table also holds the box that contains the marble and bullseye.

## **Procedure**

### **Part One (6 minutes)**

Use the materials available to build a device or devices that you will use to manipulate the marble to go and stay in the bulls-eye.

### **Part Two**

You will have 15 seconds to set up your device or devices.

You will then have up to one minute to manipulate the marble within the box, to go and stay as close to the center of the bullseye, for a specified amount of time.

## **Scoring**

20 points for being able to manipulate the marble into the bullseye with your device or devices

10 points if the marble remains in the bullseye (1-4) for 20 seconds

20 points if the marble remains in the bullseye (2-4) for 20 seconds

30 points if the marble remains in the bullseye (3-4) for 20 seconds

40 points if the marble remains in the bullseye (4-4) for 20 seconds

Up to 20 points for the creative use of the materials

Up to 20 points for teamwork

## Appraiser's Materials List Preparation

# BULLSEYE

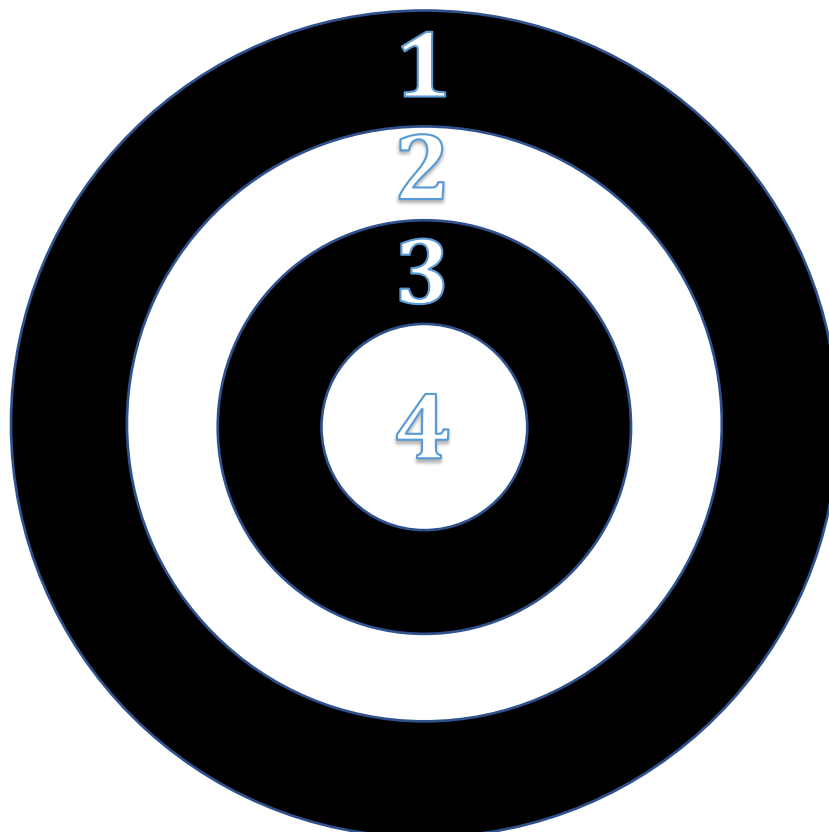
(Technical)

### Materials List (for creating device)

3 clothes pins	8 pipe cleaners
4 rubber bands	3 plastic spoons
12-inch piece of string	pair of chopsticks
2 ping pong balls	

### Other Materials:

- Box (shoe box or any cardboard box with an open top).
- A bullseye on the bottom of the box. (You may copy or print the one below and place or tape to the bottom of the box or draw or a bullseye of your choice size directly on the bottom of the box.)
- A marble (may be in box or in a separate small container next to box)
- Materials List (Place or Tape on Table with Materials)
- Team Copy of Challenge



# BULLSEYE

(Technical)

## Appraiser Notes and Post IC Debriefing for Bullseye

The intention of this IC is that the team should strive to effectively solve the Challenge AND in doing so, they and you should identify individual and team technical skills and strengths.

This challenge does not have any MAY NOTS. For example, it does not say that the Team may not touch the marble, team members hands/bodies may not cross sides of the box, items may not be placed in the box, etc.

If the Team, for example, takes a rubber band and puts it in the center of the bullseye and places the marble into the center, it may likely stay and they will have effectively solved the challenge. They should be congratulated on their success. However, they/you did not have the opportunity to evaluate individual and team technical skills. Revise the challenge and have the team try it again at the same or at a future meeting. You may even wish to eliminate or substitute some of the materials to make it more challenging as the Team advances.

## Sample Processing Questions

- What did you like about this challenge?
- How well did your Team work together?
- Did your devices work as intended?
- Did you ask for time remaining?
- Did you enjoy making tools to reach a goal?
- Did you have another idea that you wished you had tried?
- What would you do differently?
- Was \_\_\_\_\_ more difficult than expected?

# BULLSEYE

(Technical)

## APPRAISER RUBRICS

Subjective scoring elements such as Creative Use of Materials and Teamwork in an Instant Challenge often include Rubrics to assist in evaluation of solutions. At Tournaments, each Appraiser may use the Rubric, use the rubric AND other personal methods of evaluating or use only their personal methods of evaluating. However, each Appraiser is to be consistent in scoring method for all Teams. For example, if you thought that picking up the marble with the spoon and putting it in the center of the bullseye was excellent creative use of materials when the 1<sup>st</sup> Team did it, it is still excellent when the 6<sup>th</sup> Team does it.

The Rubrics are a guide to help you have a full range of scoring. Most Tournament IC Appraisers will score based on high expectations. For example, if your Team receives 50% of the Teamwork score, the Appraisers thought the Teamwork was good – what they expected from a Team at Tournament. The Team did well. While scoring should be consistent if you are evaluating multiple Teams, it will change from IC to IC and as your Team develops and your expectations rise. You may prefer to have the Team self-evaluate and discuss as part of the debriefing.

### RUBRICS FOR APPRAISING THE CREATIVE USE OF MATERIALS

1-5	6-10	11-15	16-20
Materials were used at a basic level. Few materials were used nor evaluated by Team.	Some materials were used creatively. Most materials were or evaluated as possibilities	Solution was enhanced by creative use. Materials were combined in creative ways.	Creativity was exemplary. Materials were used, evaluated and creatively combined to enhance solution.

### RUBRICS FOR APPRAISING TEAMWORK

1-5	6-10	11-15	16-20
Dominating individual Cooperation is minimal Little sharing of ideas	Some evidence of individual team member roles Some cooperation Some acceptance of ideas of others	Acceptance of other roles/expertise Good Cooperation Sharing and acceptance of ideas	Leadership and roles clearly accepted and identified by Team. Diversity of skills, mutually respected and evident. Team dynamics are exemplary.

## Rain, Rain, Go Away (Engineering)

### Challenge

Your TASK is to build a freestanding tower that will support a cup that will catch and hold rain.

### Time

You will have up to 5 minutes to build your freestanding tower and place the cup that will hold the rain. The cup **MUST** be positioned and remain at least 1" above the table.

### Setup

In the center of the room is a table with materials which you may use to build the tower. The tower **MUST** be built in the plastic container that is on the table during Part One.

### Procedure

#### Part One (5 minutes)

Use the materials available to build a freestanding tower that will hold the cup to catch the rain.

At the end of Part One, the tower, including the cup, will be measured for height.

Part Two (1 minute) Team member(s) will pour the water from the provided waterspout into the cup. The cup **MUST** remain filled to the indicator line marked approximately  $\frac{1}{2}$ " from the top of the cup.

### Scoring

10 points if the freestanding tower is able to hold the cup

3 points if the tower holds the pouring water for 5 seconds

6 points if the tower holds the pouring water for 10 seconds

10 points if the tower holds the pouring water for 15 seconds

1 point for each 2.5 cm of height of the freestanding tower (up to 40 points)

Up to 20 points for the creative use of materials

Up to 20 points for teamwork



# **Rain, Rain, Go Away**

## **(Engineering)**

### **Materials List**

4 mailing labels	5 pipe cleaners
4 rubber bands	12-inch piece of string
3 note cards	4 straws
2 popsicle sticks	6 toothpicks
1 cup (to hold rain)	

A measuring device such as a yardstick, tape measure or ruler has also been provided for you to measure your tower during Part One. The measuring device may not be damaged and may not be part of your solution.

## Rain, Rain, Go Away (Engineering)

### Challenge

Your TASK is to build a freestanding tower that will support a cup that will catch and hold rain.

### Time

You will have up to 5 minutes to build your freestanding tower and place the cup that will hold the rain. The cup **MUST** be positioned and remain at least 1" above the table.

### Setup

In the center of the room is a table with materials which you may use to build the tower. The tower **MUST** be built in the plastic container that is on the table during Part One.

### Procedure

#### Part One (5 minutes)

Use the materials available to build a freestanding tower that will hold the cup to catch the rain.

At the end of Part One, the tower, including the cup, will be measured for height.

Part Two (1 minute) Team member(s) will pour the water from the provided waterspout into the cup. The cup **MUST** remain filled to the indicator line marked approximately  $\frac{1}{2}$ " from the top of the cup.

### Scoring

10 points if the freestanding tower is able to hold the cup

3 points if the tower holds the pouring water for 5 seconds

6 points if the tower holds the pouring water for 10 seconds

10 points if the tower holds the pouring water for 15 seconds

1 point for each 2.5 cm of height of the freestanding tower (up to 40 points)

Up to 20 points for the creative use of materials

Up to 20 points for teamwork

## APPRAISER PREPARATION

# Rain, Rain, Go Away (Engineering)

### Materials to be used by Team

4 mailing labels	5 pipe cleaners
4 rubber bands	12-inch piece of string
3 index cards	4 straws
2 popsicle sticks	6 toothpicks
1 cup (to hold rain)	

### Other Materials/Setup

**A shallow plastic container (like storage box).** This is to protect the table and room from the rain. The tower should be built inside the container at the end of Part 1.

The materials list (taped or placed on the materials table)

Cup (to hold rain) – a small (3oz) cup or other lightweight small cup is a good starting size. You can substitute to make the challenge more difficult or easier. Draw or mark with tape a fill line on the inside of the cup about ½” from top. You can adjust the position of the line to vary difficulty.

Measuring Device – Tape Measure, Ruler or Yard Stick

Rain Maker – If you have a small watering can with a sprinkler head, use it! If not, there are several easy ways to make a Rain Maker. Punch holes in the lid of a ½ gallon plastic milk jug, a water bottle (you can poke small holes around the top of water bottle (not harder lid) or the bottom of a cup with a small nail, tack, etc. if punching through a harder lid, heating the nail or tack will make it easier. If you use a cup, you can provide a separate water bottle or container of water for the Team to use to fill the Rain Maker in Part Two. NOTE: If you use a Styrofoam cup, you should be able to use the toothpick to poke the holes in the bottom without any special tools. For advanced Teams, let them make the Rain Maker.



A YouTube search of DIY sprinkler watering can will show you step by step if you need more direction.

# Rain, Rain, Go Away

## (Engineering)

### APPRAISER RUBRICS

Subjective scoring elements such as Creative Use of Materials and Teamwork in an Instant Challenge often include Rubrics to assist in evaluation of solutions. At Tournaments, each Appraiser may use the Rubric, use the rubric AND other personal methods of evaluating or use only their personal methods or evaluating. However, each Appraiser is to be consistent in scoring method for all Teams. For example, if you thought that picking up the marble with the spoon and putting it in the center of the bullseye was excellent creative use of materials when the 1<sup>st</sup> Team did it, it is still excellent when the 6<sup>th</sup> Team does it.

The Rubrics are a guide to help you have a full range of scoring. Most Tournament IC Appraisers will score based on high expectations. For example, if your Team receives 50% of the Teamwork score, the Appraisers thought the Teamwork was good – what they expected from a Team at Tournament. The Team did well. While scoring should be consistent if you are evaluating multiple Teams, it will change from IC to IC and as your Team develops and your expectations rise. You may prefer to have the Team self-evaluate and discuss as part of the debriefing.

#### RUBRICS FOR APPRAISING THE CREATIVE USE OF MATERIALS

1-5	6-10	11-15	16-20
Materials were used at a basic level.  Few materials were used nor evaluated by Team.	Some materials were used creatively.  Most materials were or evaluated as possibilities	Solution was enhanced by creative use.  Materials were combined in creative ways.	Creativity was exemplary.  Materials were used, evaluated and creatively combined to enhance solution.

#### RUBRICS FOR APPRAISING TEAMWORK

1-5	6-10	11-15	16-20
Dominating individual Cooperation is minimal Little sharing of ideas	Some evidence of individual team member roles  Some cooperation Some acceptance of ideas of others	Acceptance of other roles/expertise Good Cooperation Sharing and acceptance of ideas	Leadership and roles clearly accepted and identified by Team. Diversity of skills, mutually respected and evident. Team dynamics are exemplary.

# **Rain, Rain, Go Away**

## **(Engineering)**

### **Appraiser Notes and Debriefing/Processing**

Rain, Rain, Go Away incorporates the lesser used element of water into this engineering instant challenge. Many participants will be familiar with building a tower to support weight, but not how the materials used could hold up when wet.

This IC, though involve more materials and set-up, is likely to be a Team's favorite. This is a good activity to recruit a parent or other assistant as IC Leader (and/or co-TM). The IC Leader can be someone that can attend a portion of the Team Meeting, or assist to prepare and provide the materials. Since every IC is a surprise for the Team, it's not Interference but rather skills teaching to debrief, discuss and even allow parents to try it for themselves. There will be no audience for Instant Challenge at Tournaments and the participants may not discuss the IC until after Global Finals. They have to take the IC Pledge just prior to each Tournament IC. The more IC experience they have in advance, the better it will be for them!

#### **Sample Processing Questions**

- What did you like about this challenge?
- How well did your Team work together?
- Did your materials work as intended?
- Did you ask for time remaining?
- Did you have another idea that you wished you had tried?
- What would you do differently?
- Was \_\_\_\_\_ more difficult than expected?

## TEAM COPY

# Friends Forever

## (Scientific)

### Challenge

Your TASK is to build a device that will allow an animal to live with its best friend from a different habitat. You are to present a PERFORMANCE about the buddies and how your device works. You must include the scientific reason of how the device enables the buddy animal to live in a different environment.

### Time

You have up to 6 minutes to build your device for one of the animals to be able to live with its best friend from a different habitat and also to prepare for your performance. You have up to 3 minutes to present your Performance.

### Setup

In the center of the room is a table that holds the list of buddy animals and the materials you may use to build your device.

### Procedure

#### **Part One (6 minutes)**

Pick a pair of buddy animals from the list provided. Each member of the buddy pair lives in a different habitat. As a team, you need to decide which animal from your buddy pair will move into its buddy's habitat. You will then need to identify what that animal needs to live in the new habitat and build a device that will allow it to live there.

#### **Part Two (3 Minutes)**

You have 3 minutes for your PERFORMANCE. You must include at least one fact about the buddy animals and each habitat. You will include your device and scientifically explain how it allows the animal to live in the new habitat. You have to identify what the animal needs to have in order to survive in the new habitat as part of your PERFORMANCE.

### Scoring

20 points for creating a device and including it in your PERFORMANCE

Up to 20 points for a scientific appropriate reason for the device in your PERFORMANCE.

Up to 20 points for presentation of facts in your PERFORMANCE

Up to 20 points for the creative use of materials

Up to 20 points for teamwork

## APPRAISER COPY

# Friends Forever (Scientific)

### Challenge

Your TASK is to build a device that will allow an animal to live with its best friend from a different habitat. You are to present a PERFORMANCE about the buddies and how your device works. Your must include the scientific reason of how the device enables the buddy animal to live in a different environment.

### Time

You have up to 6 minutes to build your device for one of the animals to be able to live with its best friend from a different habitat and also to prepare for your performance. You have up to 3 minutes to present your Performance.

### Setup

In the center of the room is a table that holds the list of buddy animals and the materials you may use to build your device.

### Procedure

#### **Part One (6 minutes)**

Pick a pair of buddy animals from the list provided. Each member of the buddy pair lives in a different habitat. As a team, you need to decide which animal from your buddy pair will move into its buddy's habitat. You will then need to identify what that animal needs to live in the new habitat and build a device that will allow it to live there.

#### **Part Two (3 Minutes)**

You have 3 minutes for your PERFORMANCE. You must include at least one fact about the buddy animals and each habitat. You will include your device and scientifically explain how it allows the animal to live in the new habitat. You have to identify what the animal needs to have in order to survive in the new habitat as part of your PERFORMANCE.

### Materials

1 egg carton or box	5 Cotton Balls
3 Straws	4 Pipe cleaners
1 balloon (or non-latex glove)	12" piece of string
2 Paper Plates	6 mailing labels
5 rubber bands	1 cup
Aluminum Foil	5 toothpicks

### Scoring

20 points for creating a device and including it in your PERFORMANCE

Up to 20 points for a scientific appropriate reason for the device in your PERFORMANCE.

Up to 20 points for presentation of facts in your PERFORMANCE

Up to 20 points for the creative use of materials

Up to 20 points for teamwork

# FRIENDS FOREVER

(Scientific)

## Materials

1 egg carton or box	5 Cotton Balls
3 Straws	4 Pipe cleaners
1 balloon (or non-latex glove)	12" piece of string
2 Paper Plates	6 mailing labels
5 rubber bands	1 cup
Aluminum Foil	5 toothpicks

A sheet of paper and a pencil will also be available as your Team prepares and presents your PERFORMANCE.

---

## Buddy Animal List

<b>Buddy Team</b>	<b>Buddy #1</b>	<b>Environment Choice #1</b>	<b>Buddy #2</b>	<b>Environment Choice #2</b>
<b>Team A</b>	Dolphin	Ocean	Lion	Africa Grassy Plains
<b>Team B</b>	Polar Bear	Arctic	Rattlesnake	SW America Desert
<b>Team C</b>	Cow	Farm	Octopus	Rock den in the Pacific Ocean
<b>Team D</b>	T-Rex	North American River Valleys 65 million years ago	House Cat	Your Home
<b>Team E</b>	Humpback Whale	Ocean – migrate from warm tropical to arctic	Squirrel	Your Back Yard



# Friends Forever

## QUICK FACT SHEET - BUDDY ANIMAL TEAM A

### Dolphin

- Compared to other animals, dolphins are believed to be very intelligent.
- Dolphins are carnivores (meat eaters).
- The Killer Whale (also known as Orca) is actually a type of dolphin.
- Bottlenose dolphins are the most common and well-known type of dolphin.
- Female dolphins are called cows; males are called bulls and young dolphins are called calves.
- Dolphins live in schools or pods of up to 12 individuals.
- Dolphins use a blowhole on top of their heads to breathe.
- Dolphins have excellent eyesight and hearing as well as the ability to use echolocation for finding objects.
- Dolphins communicate with each other by clicking, whistling and other sounds.

### Ocean Habitat

- **Marine habitats include oceans and seas, which both have saltwater.**
- Saltwater is water that has 35g of salt for every kilogram of water. It's not something most mammals can drink as it will just make them thirstier!
- Oceans and seas cover over 70% of the Earth's surface.
- **There are five oceans across the planet, and over 100 different seas.**
- Having salt in the water means that it takes a lower temperature for the water to freeze (it normally freezes at 0°C). So, some marine animals have adapted to living in waters that are below 0°C, especially around **polar regions**.
- **About three-fifths of all the fish species that we know about live in marine habitats.**

### Lion

- African lions live together in groups or "prides." A pride consists of about 15 lions.
- Male lions defend the pride's territory while females do most of the hunting.
- The lion was once found throughout Africa, Asia and Europe but now exists only in Africa with one exception. The last remaining Asiatic lions are found in Sasan-Gir National Park in India.
- A lion's roar can be heard from as far as 5 miles away.
- A lion can run for short distances at 50 mph and leap as far as 36 feet.

### African Grassy Plains

The Grassy Plains where African lions live are primarily in central and south Africa

They like the hot places like the Sahara in Africa and the dryer regions

Although the lion is popularly known as the 'King of the Jungle', it does not actually live in the jungle! Lions are not found in tropical rainforests or deserts. They are found living on grassy plains, dry thorn forests, Savannas, open woodlands, scrubs, prairies, and semi-arid plains of sub-Saharan Africa. Lions prefer to live near rivers or their tributaries, because of constant water supply. Moreover, the water also attracts their prey, thereby increasing prey density in the area.

# Friends Forever

## QUICK FACT SHEET - BUDDY ANIMAL TEAM B

### Polar Bear

- Polar bears use sea ice as a platform to hunt seals.
- Seals make up most of a polar bears diet.
- Male polar bears can weigh up to 680 kg (1500 lb.).
- Female polar bears usually only weigh about half as much as males.
- Polar bears spend most of their time at sea.
- Polar bears have 42 teeth.
- The scientific name for the polar bear is 'ursus maritimus'.
- Polar bears keep warm thanks to nearly 10 cm of blubber under the skin.
- Polar bears can reach speeds up to 40 kph (25 mph) on land and 10 kph (6 mph) in water.

### Arctic Habitat

- The Arctic is located at the northernmost part of our planet. Scientists usually define the Arctic as the area above the 'Arctic Circle' — an imaginary line that circles around the top of the globe.
- The Arctic consists of the Arctic Ocean and parts of Canada, Russia, the USA, Greenland, Norway, Finland, Sweden and Iceland.
- Because of the Earth's tilt, for at least one day a year there's an entire day of darkness in this freezing region — and also a full day of sunshine. Imagine that!
- Temperatures as low as **-70°C** have been recorded in northern Greenland. *Brrrrr!*

### Rattlesnake

- **Rattlesnakes** are venomous snakes characterized by a segmented rattle at the tip of the tail that produces a buzzing sound when vibrated.
- There are about **36 known species of rattlesnakes**.
- Rattlesnakes are **native to the Americas**, ranging from southern Canada to central Argentina but are most abundant and diverse in the southwestern United States and northern Mexico.
- Rattlesnakes can be **found in a wide variety of habitats**. They are most abundant in the desert sands of the Southwest, but they also like rocky areas, prairies, marshes and forests.

### 3SW America Desert

Deserts are defined by a lack of water. They are arid places that generally receive less than 10 inches (25 cm) of rain per year and where water is severely limiting. Deserts can be cold or hot, and their plants, animals, and people have adapted to scarce and unpredictable rainfall events. Three major Deserts fall partially within the area covered by the Science of the American Southwest. The Sonoran Desert occurs in southern Arizona and extends into California, and well into Mexico. It is a subtropical desert considered by some to be the biologically richest desert in the world. The Chihuahuan Desert occurs mainly in Mexico but extends north into Arizona, New Mexico, and Texas. The Great Basin Desert covers most of Nevada and portions of Arizona, New Mexico, Colorado, Utah, Wyoming, Idaho, and Oregon.

# Friends Forever

## QUICK FACT SHEET - BUDDY ANIMAL TEAM C

### **Cow**

- A cow's normal body temperature is 101.5°F.
- The average cow chews at least 50 times per minute.
- The typical cow stands up and sits down about 14 times a day.
- An average cow has more than 40,000 jaw movements in a day.
- Cows actually do not bite grass; instead they curl their tongue around it.
- Cows have almost total 360-degree panoramic vision.
- Cows have a single stomach, but four different digestive compartments.
- You can lead a cow upstairs, but not downstairs. Cows knees can't bend properly to walk downstairs.

### **Farm**

- Farmers typically grow their own forage for their cattle. Crops grown may include corn, alfalfa, timothy, wheat, oats, sorghum and clover.
- Dairy Farms have cows that are farmed for their milk.
- Cattle Farms may also raise cows for meat.
- It typically takes a farmer 20 minutes to milk a cow. This process is done about two or three times a day on average.
- Since the average cow drinks 30 to 50 gallons of water each day, farms must have a reliable source of fresh water.
- Farms are usually fenced to contain the cattle and other livestock.
- Many farms have barns.

### **Octopus**

- All octopuses have head, called mantle, surrounded with 8 arms, called tentacles. All vital organs are located in their head.
- Their color and size are determined by their environment. Those that live in colder water will be much larger than those that live in tropical (warm) water.
- Only hard structure in their body is beak which looks like a parrot beak. They use their beaks for eating.
- Although they are invertebrates, they have incredibly developed nervous system and they can learn various things. Some experiments showed that they can solve puzzles, distinguish shapes and patterns. They can develop both short- and long-term memory.

### ***Rock Den in the Pacific Ocean***

- The water depth in which octopuses live ranges from the shallow, coastal waters to about 330 feet deep. The Pacific octopus is a benthic creature. It lives on the ocean floor.
- Dens are a very important place of shelter for these octopuses. They greatly enjoy spending their time in areas under rock cover where they can easily camouflage themselves. They often create, or choose, a den that has many entrances. The Pacific octopus rarely lives in a single den for longer than one month, unless it's a female with her eggs. Dens left uninhabited are frequently moved into by other giant octopuses, who then live there for another short period of time.
- Ocean water is salt water which non-marine animals can't drink.

# Friends Forever

## QUICK FACT SHEET - BUDDY ANIMAL TEAM D

### T-Rex

- Tyrannosaurus Rex had powerful back legs that let it hunt prey over short distances at up to 20mph (32 kph).
- Tyrannosaurus Rex means 'Tyrant Lizard'.
- T. Rex were one of the biggest meat eaters.
- The largest T. Rex tooth found is 12 inches (30 cm) long.
- They could sprint up to 20 mph (32 kph).

### *North American River Valleys 65 million years ago*

- T Rex lived about 65 to 70 million years ago - in the late cretaceous period.
- Tyrannosaurus rex probably lived in forests, where its prey could find plenty of food.
- They would have charged out of the undergrowth to surprise their prey

### House Cat

- COMMON NAME: Domestic Cat
- SCIENTIFIC NAME: Felis catus
- TYPE: Mammals
- DIET: Carnivores
- SIZE: 28 in
- WEIGHT: 5 to 20 lbs.
- Felis catus has had a very long relationship with humans. Ancient Egyptians may have first domesticated cats as early as 4,000 years ago. Plentiful rodents probably drew wild felines to human communities. The cats' skill in killing them may have first earned the affectionate attention of humans.

### *Your Home*

- How tall are the ceilings?
- Domesticated cats may remain indoors all the time (a house cat) or be indoor/outdoor cats.
- House cats typically have litter boxes
- House cats are fed commercially prepared food.

# Friends Forever

## QUICK FACT SHEET - BUDDY ANIMAL TEAM E

### Humpback Whale

The **humpback whale** (*Megaptera novaeangliae*) is a species of **baleen whale**. One of the larger species, adults range in length from 12–16 m (39–52 ft) and weigh around 25–30 metric tons (28–33 short tons). The humpback has a distinctive body shape, with long **pectoral fins** and a knobby head. It is known for **breaching** and other distinctive **surface behaviors**, making it popular with **whale watchers**. Males produce a complex **song** lasting 10 to 20 minutes, which they repeat for hours at a time. Its purpose is not clear, though it may have a role in mating.

Their diet consists mostly of **krill** and small **fish**. Humpbacks have a diverse repertoire of feeding methods.

### Ocean

- Found in oceans and seas around the world, humpback whales typically migrate up to 25,000 km (16,000 mi) each year.
- They feed in polar waters, and migrate to tropical or subtropical waters to breed and give birth, fasting and living off their fat reserves.
- Ocean water is saltwater. Other animals, like humans and squirrels, can't drink it. It only makes us thirstier.

### Squirrel

- There are over 265 species of squirrel worldwide. The smallest is the African pygmy squirrel which is tiny at around 10 cm long, whereas the largest, the Indian giant squirrel is a massive three feet long.
- When a squirrel is scared, and feels that it is in danger, it will at first remain motionless. If it is on the ground, it will run to a nearby tree and climb to safety, and if it is already in a tree it will circle the trunk and press up against the bark tightly with its body.
- Squirrels are very trusting animals, and are of the very few wild animal species which will eat out of a person's hand.
- In colder regions, such as the UK, squirrels plan ahead in order to survive the challenging winter months. They store nuts and seeds at various locations and return to them throughout the winter to maintain their energy levels when food is scarce.
- Squirrels tend to run in erratic paths. This is intended to deceive potential predators as to its chosen direction so that it may escape.

### Your Backyard

- Many squirrels use dens for long winters.
- During warmer months, a dray may serve for sleep and for raising babies. A dray consists of leaves and twigs arranged as a nest and tucked away in the branches of a tree.
- When a squirrel isn't running around looking for nuts or scampering about in trees, she may be found underground in her burrow caring for her young or sleeping at night. Tree squirrels will call it a day by heading to their dens or drays.

# FRIENDS FOREVER

(Scientific)

## Appraiser Preparation

### Materials List

- |                                |                     |
|--------------------------------|---------------------|
| 1 egg carton or box            | 5 Cotton Balls      |
| 3 Straws                       | 4 Pipe cleaners     |
| 1 balloon (or non-latex glove) | 12" piece of string |
| 2 Paper Plates                 | 6 mailing labels    |
| 5 rubber bands                 | 1 cup               |
| Aluminum foil                  | 5 toothpicks        |

### Other Materials/Preparation

Print the Team Copy of Challenge

Print the Materials List/Buddy Animal List and place or tape on table with materials

Print Quick Fact Sheets.

Alternatively, you may allow research time for the Team(s) or individual participants to research the animals and environments and prepare their own facts. This gives the Team a taste for the research element that is commonly a part of the Scientific Challenge.

### Processing Questions/Talk Like A Scientist

DI Teams regardless of the Challenge Selected can often benefit by practicing talking to each other as they would to another scientist. The following resource was shared at the Cobb County 2018 STEMAPALOOZA by Tracy Mathews [tracy.mathews@cobbk12.org](mailto:tracy.mathews@cobbk12.org) sessions "Creating a Culture of Discourse". It makes a great pre-IC activity and/or post processing activity.

### Science Talk Sentence Starters

When scientists share <b>their own ideas</b> , they might say:	When scientists respond to <b>others' ideas</b> , they might say:
I observed _____.	Tell me more about _____.
I noticed _____.	Please explain _____.
I think _____ because _____.	I'm confused about _____.
Based on my/our data, I think _____.	Why do you think _____?
If _____, then _____.	What evidence supports _____?
I wonder _____.	Are you saying _____?
What would happen if _____?	I agree/disagree with _____ because _____.

Review IC and Scoring while practicing talking like a scientist.

Have Team Develop Scoring Rubric(s) while talking like scientists.

## TEAM COPY

# Written All Over Your Face

## (Fine Arts)

Your task is to create and PERFORM a skit with 5 different emotions while having a beginning middle and end.

### Time

You 5 minutes to plan your PERFORMANCE and use the materials given to make the props. You will 2 minutes to perform your skit.

### Setup

In the center of the room is a table that holds the list of emotions and materials that you may use to make your props.

### Procedure

Part One: You have 5 minutes to plan a PERFORMANCE that will effectively portray the 5 selected emotions in 1 or more team created characters. You will also use the materials to create the props for your PERFORMANCE.

Part Two: You 2 minutes to perform your skit.

### Materials

7 Sheets of paper

8 markers

4 paper plates

3 paper cups

5 pipe cleaners

### Scoring

Up to 50 points, 10 points each, for the effective portrayal and integration of each emotion

Up to 20 points for creativity of the PERFORMANCE

Up to 15 points for creativity and integration of your props

Up to 15 points for teamwork

## APPRAISER COPY

# Written All Over Your Face

## (Fine Arts)

Your task is to create and PERFORM a skit with 5 different emotions while having a beginning middle and end.

### Time

You 5 minutes to plan your PERFORMANCE and use the materials given to make the props. You will 2 minutes to perform your skit.

### Setup

In the center of the room is a table that holds the list of emotions and materials that you may use to make your props.

### Procedure

Part One: You have 5 minutes to plan a PERFORMANCE that will effectively portray the 5 selected emotions in 1 or more team created characters. You will also use the materials to create the props for your PERFORMANCE.

Part Two: You 2 minutes to perform your skit.

### Materials

7 Sheets of paper

8 markers

4 paper plates

3 paper cups

5 pipe cleaners

### Scoring

Up to 50 points, 10 points each, for the effective portrayal and integration of each emotion

Up to 20 points for creativity of the PERFORMANCE

Up to 15 points for creativity and integration of your props

Up to 15 points for teamwork



# Written All Over Your Face

(Fine Arts)

## MATERIALS LIST

- 7 Sheets of paper
  - 8 markers
  - 4 paper plates
  - 3 paper cups
  - 5 pipe cleaners
- 

## List of Emotions

1. Angry
2. Thrilled
3. Excited
4. Scared
5. Shy
6. Lazy
7. Mean
8. Needy
9. Crazy
10. Hopeful

## APPRAISER COPY

# Written All Over Your Face

## (Fine Arts)

### Preparation/Set Up

#### Materials List

7 Sheets of paper	8 markers
4 paper plates	3 paper cups
5 pipe cleaners	

### TEAM COPY OF CHALLENGE

**MATERIALS LIST/LIST OF EMOTIONS** (tape or place on table beside materials)

#### Processing Questions:

- Do you enjoy performing?
- Do you like designing and creating props?
- What do you like to do and are good at doing that would be useful in a Fine Arts Performance? (Sing, acting experience, costume design, play an instrument, artistic, dance, etc.)
- Allow self-evaluation and discussion of scoring.

The Fine Arts Challenge typically contains a technical component. This may be noted if one or more of your Team Members is reluctant to participate in a Fine Arts Challenge. The experience and confidence that comes from presenting a Fine Arts solution can be life changing for traditional STEM learners. HR experts agree that there are countless geniuses, but they are unable to communicate their ideas to other effectively. The skills learned will serve them well in interviews, college and careers.

## Human Scenery (Improvisational)

Surprise! You've been sent on a space mission to the planet Mars but you've landed on a mysterious new planet! Your challenge is to create a PERFORMANCE of the exciting new discoveries that you found on the new planet using as much human scenery as possible.

### Time

You 6 minutes to plan your PERFORMANCE. You will then have 2 minutes to perform your skit.

### Setup

In the center of the room is a table that holds a piece of paper and a pencil that you may use as you prepare and present your PERFORMANCE.

### Procedure

#### **Part One (6 minutes)**

You have 7 minutes to plan your skit and the human scenery.

#### **Part Two (1 minute)**

Your Team will be given a random Improv Element from the following list. You have 1 minute to discuss how you will incorporate the Improv Element into your skit.

#### **Part Three (2 minutes)**

You have up to 2 minutes to perform your skit to the appraisers.

### Materials

- One sheet of Paper
- Pencil

### Scoring

Up to 5 points each (40 points maximum) for each human scenery presented

Up to 20 points for overall creativity of the skit

Up to 20 for the creative integration of the Improv Element

Up to 20 points for teamwork

**Human Scenery**  
(Improvisational)

***Improv Element***

Your Team will receive 1 of the following Improv Element Scenarios 1 minute prior to your PERFORMANCE.

The New Planet **IS VERY WINDY.**

The New Planet **HAS A VERY STICKY SURFACE.**

The New Planet **IS VERY SMALL.**

The New Planet **IS INHABITED BY BIRDS.**

The New Planet **MAKES YOU SNEEZE.**

The New Planet is **MUSICAL.**

## APPRAISER COPY

# Human Scenery (Improvisational)

Surprise! You've been sent on a space mission to the planet Mars but you've landed on a mysterious new planet! Your challenge is to create a PERFORMANCE of the exciting new discoveries that you found on the new planet using as much human scenery as possible.

### Time

You 6 minutes to plan your PERFORMANCE. You will then have 2 minutes to perform your skit.

### Setup

In the center of the room is a table that holds a piece of paper and a pencil that you may use as you prepare and present your PERFORMANCE.

### Procedure

#### **Part One (6 minutes)**

You have 7 minutes to plan your skit and the human scenery.

#### **Part Two (1 minute)**

Your Team will be given a random Improv Element from the following list. You have 1 minute to discuss how you will incorporate the Improv Element into your skit.

#### **Part Three (2 minutes)**

You have up to 2 minutes to perform your skit to the appraisers.

### Materials

- One sheet of Paper
- Pencil

### Scoring

Up to 5 points each (40 points maximum) for each human scenery presented

Up to 20 points for overall creativity of the skit

Up to 20 for the creative integration of the Improv Element

Up to 20 points for teamwork

## APPRAISER COPY

# Human Scenery (Improvitational)

The only materials are a **sheet of paper and a pencil**.

You will also provide:

The **Team Copy of the Challenge**

The **List of IMPROV ELEMENT Scenarios** (taped or placed on the table with the paper and pencil)

A timer that beeps.

A second list of **IMPROV ELEMENTS cut into strips** (or a dice or other method to select a random Element)

You may conduct this Challenge "Tournament Style" as follows.

Have the Team leave the room (if not practical, move to another portion of the room). If parents are in attendance, this will be useful information for them as well.

Collect all electronics including cell phones, watches and any other items you feel would be a distraction to the Team. No electronics nor timing devices are allowed in the IC Room. Remember that you can ask the Time Keeper Appraiser how much Time is remaining at any time. At Georgia Tournaments, we will provide a bin or bag for your belongings that can be left just outside the door. At some Tournaments, including Global Finals they are NOT allowed in the building.

"At Tournament, only the participating Team Members and 1 Team Manager (if the Team permits) are allowed in the Instant Challenge Tournament Site. In the IC Prep Area, you will give the prep area Appraiser a copy of your signed declaration of Independence and check the box stating that you know nothing about the Instant Challenge you will be given. Then you will say the following Instant Challenge Pledge."

**"We promise not to talk about the Instant Challenge or what we did in our solution UNTIL THE END OF MAY. If we are heard or are found to have shared this Challenge with anyone, we will be disqualified from the tournament. However, we can talk about it privately among our team and Team Manager(s)!"**

### Note:

The reason for the pledge is that DI Teams from all over the world compete in Instant Challenge at different times. The ICs must remain secret until after Global Finals in May.

## Human Scenery (Improvisational)

Have the Team enter the room or the IC area of the room.

At Tournament,

1. The Appraisers will introduce themselves and the
2. Time Keeper Appraiser will be noted.
3. The Team Manager will be seated and will not give any cues or assistance to the Team.
4. An Appraiser will read the Welcome.

**“WELCOME to the Instant Challenge portion of our tournament. Anything is possible here, and you will have the opportunity to use the problem-solving tools and the creative process you have learned. Every team participating in your Team Challenge at your competition level will be presented this Instant Challenge today. Once the Instant Challenge begins, any participating team member may ask how much time remains in that part of the Challenge.”**

5. Hand the Team the Team Copy of the Challenge (At Tournaments they will be given 2 copies)
6. And begin reading the Challenge. (The Appraisers will not answer any questions until time begins. You may indicate materials, with a gesture and verify they are correct as they are read.)

## APPRAISER COPY

# Human Scenery (Improvisational)

Surprise! You've been sent on a space mission to the planet Mars but you've landed on a mysterious new planet! Your challenge is to create a PERFORMANCE of the exciting new discoveries that you found on the new planet using as much human scenery as possible.

### Time

You 6 minutes to plan your PERFORMANCE. You will then have 2 minutes to perform your skit.

### Setup

In the center of the room is a table that holds a piece of paper and a pencil that you may use as you prepare and present your PERFORMANCE.

### Procedure

#### **Part One (6 minutes)**

You have 7 minutes to plan your skit and the human scenery.

#### **Part Two (1 minute)**

Your Team will be given a random Improv Element from the following list. You have 1 minute to discuss how you will incorporate the Improv Element into your skit.

#### **Part Three (2 minutes)**

You have up to 2 minutes to perform your skit to the appraisers.

### Materials

- One sheet of Paper
- Pencil

### Scoring

Up to 5 points each (40 points maximum) for each human scenery presented

Up to 20 points for overall creativity of the skit

Up to 20 for the creative integration of the Improv Element

Up to 20 points for teamwork

Once you have read the challenge repeat the following

***“Again, your Challenge is to create a PERFORMANCE of the exciting new discoveries that you found on the new planet using as much human scenery as possible and incorporate a last-minute Improv Element Scenario into your presentation.*”**

***“You have 6 minutes, you may begin.” Start the timer.*”**

During the 6 minutes, any Team member may ask questions and ask for time remaining. The Team may call “Time” if they are finished before the Timer before time runs out. This is particularly useful when, for example, you have built a tower and want it to be measured while it is still standing.



At the end of Part One, give the Team the Improv Element should be selected (pick a strip of paper, roll a dice, etc.). Read aloud and say “**You have one-minute beginning now**” and start timer.

When the timer beeps, reset for 2 minutes and say “**Your PERFORMANCE begins NOW**” and start timer. At the end of the PERFORMANCE the Team may call Time if there is time remaining.

At Tournaments, the Appraisers do not discuss your performance nor give any scores nor feedback. You will be escorted from the IC room with your Team Manager with the instructions to remember to not talk about the challenge to anyone until after Global Finals. Sometimes there is a “Chill Out” room for your use before you join your parents and general public. At Globals there is an opportunity to present a “Ta Da!” performance of your choosing after you exit the IC building.

### **Debriefing Questions:**

What did you like about this Challenge?

How did your Team do with Improvisation?

If your Team selects the Improv Challenge as their Team Challenge there are some possible benefits.

- No or few props to create, store, transport
- Every meeting can be a “dress rehearsal”
- The Improv skills you learn will transfer to future Team Challenges and to ICs as well as those in real life.

### **Review and Discuss Scoring**

The Challenge states “a piece of paper and a pencil that you may use as you prepare and present your PERFORMANCE” so theoretically, they could have been incorporated into the Team’s solution. However, the scoring does not seem to award points for doing so.

Teams should always make sure someone reviews the scoring in the challenge to maximize points. For example,

Up to 5 points each (40 points maximum) for human scenery presented

How many different human sceneries did the Team need to present for maximum score – 8 (8 x 5 is 40) There are 8 subjective scores worth up to 5 points each. How did/could your Team make sure the Appraisers “see” your human scenery? (We clearly say what each time we use the human scenery. For example, “*The TREES here are very different from those on earth. They seem almost human.*”

## TEAM COPY

# Great Minds Helping Others (Service Learning)

### Challenge

Your TASK is to create a meme that will engage others to help meet a community need. You will pitch your need and meme in a PERFORMANCE.

For the purpose of this challenge:

A meme is a humorous and engaging image and/or piece of text that is designed to be copied with slight variations and spread rapidly on social media.

***A pitch is persuasive presentation of a project in hopes of securing support for its development.***

### Time

You have 5 minutes to brainstorm community needs and ideas to meet those needs and to create a meme. You will then have 3 minutes to plan a performance that will convince others to support your selected community need(s). You will then have 1-minute PERFORMANCE time to pitch your idea and meme.

### Setup

In the center of the room is a table that holds paper, pencils, markers and a pair of scissors.

### Procedure

#### **Part One (5 minutes)**

Brainstorm community needs and ideas to meet these needs and to create a meme.

#### **Part Two (3 minutes)**

Plan a performance that will convince others to support your selected need.

#### **Part Three (1 minutes)**

Present a PERFORMANCE to pitch your idea and meme.

### Materials

5 Sheets of Paper

5 Sharpened Pencils

Markers

### Scoring

Up to 20 points for the persuasiveness of your selected need

Up to 20 points for the persuasiveness of your ideas to support the need

Up to 20 points for the creativity of your meme

Up to 20 points for the creativity of your performance

Up to 20 points for teamwork

**Great Minds Helping Others**  
(Service Learning)

**Need and Solution Form**

<b>Needs (Up to 10)</b>	<b>Solutions (For 3 Needs)</b>
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

## **APPRAISER COPY**

# **Great Minds Helping Others** (Service Learning)

### **Appraiser Setup Only**

The set up consists of providing pencils, blank paper, scissors and markers

### **Processing Questions**

- Are you interested in following through your idea(s) to help a community need?
- Did you have convincing reasons to engage others to help you?
- Did you like creating the meme?
- Review scoring and discuss.

### 3 Simple (But Important!) Instant Challenge Tournament Tips

By: Andrew Whitmire

Growing up as a DI-er, I always got psyched out at the thought of the Instant Challenge my team and I might face at the tournament. For many years, Instant Challenge was a big and scary unknown and I thought there was no way to prepare. However, that just isn't true! If you follow these three simple Instant Challenge tournament tips, your team will become more confident about approaching not only any Instant Challenge, but anything life throws your way.

#### 1. IDENTIFY AND UNDERSTAND THE INSTANT CHALLENGE TYPE.

The table below is your friend. There are only three broad Instant Challenge types: Performance, Task and Combination (Performance + Task). Your team should spend time reading different Instant Challenges with the goal of being able to instantly identify which type they are.

Performance	Task	Combination
With Props	To Build: Height, Width or to hold Weight	Any combination of Performance and Task-based Instant Challenges
Without Props	To Move	
With Imaginary Props	To Protect	
With Team-made Props	To Communicate	
	To Change	

**Why?** If every team member is able to identify the type of Instant Challenge they have been presented, everyone can more easily boil down the tasks that need to be completed in order to maximize the score. For instance, if an Instant Challenge requires the team to transport a plastic egg as far as possible, it should be identified as a Task-Based Instant Challenge that requires movement. If the same Challenge also requires the team to come up with a name for its transportation device, the Challenge would be considered Combination.

#### 2. IDENTIFY AND UNDERSTAND THE INSTANT CHALLENGE MATERIALS.

Many Instant Challenges come with materials that your team will use to complete a task or tasks. The team should be able to survey a series of commonplace objects like straws, paperclips, sticky labels and paper and be able to sort them into the following 3 categories:

Extenders	Connectors	Controllers
Used to achieve length	Used to fasten things together	Used to contain, confine or carry

**Why?** Since Instant Challenges are usually over in about 10 minutes or less, it is important that you do not waste precious time fumbling with the materials you have been given. Having a **common vocabulary and a way to categorize the properties of the materials** you have been given will allow your team to jump into the planning and executing stages of the Instant Challenge more easily. Most materials can be categorized in multiple ways. For instance, an envelope, depending on how it is used, could be an extender, a connector or a controller. Your team should think about ways that each item you're given can be used as an extender, connector or controller. Your team should spend time just playing with typical Instant Challenge materials to help you better understand how to manipulate them quickly and efficiently.

### 3. ASSIGN INDIVIDUAL TEAM MEMBER ROLES.

Being a team doesn't mean that everyone is good at the same things. By assigning yourselves to roles that you are well-suited for you will make the time spent in the Instant Challenge room easier. Some of the potential team roles include:

<b>Task Manager</b>	Leads Task-based Instant Challenges
<b>Performance Manager</b>	Leads Performance-based Instant Challenges
<b>Timekeeper</b>	Keeps track of time left in the Instant Challenge room
<b>Materials Manager</b>	Makes sure that materials are used efficiently
<b>Score Manager</b>	Keeps track of the points, both objective and subjective
<b>Flex Team Member</b>	Works to fill in the gaps and is generally able to fill any role

**Why?** The Instant Challenge room can be intense and high-pressured because of how quickly everything happens. Walking in and having a general idea of what each team member will be focused on can have a profoundly positive effect. If your team is clear on team roles, the majority of the time can be spent solving the Challenge instead of negotiating who is doing what. Team roles are also fluid and, during practice, your team should switch them up to make sure everyone is practicing outside their comfort zone.

So, there it is. If you begin to implement these three simple techniques, your team will increase your ability to solve any Instant Challenge successfully. Just remember to Stay Calm and Instant Challenge On! Good luck!

For more information and tips on Instant Challenge, please consult the Roadmap resource that can be found with your Program Materials. You can also download a PDF version through the [Resource Area](#). To see some of our most popular Instant Challenges solved by teams around the work, check out our [Instant Challenge Video Showcase](#) on YouTube.

For more team and Team Manager tips this season, follow us on [Facebook](#), [Twitter](#) and [Instagram](#).