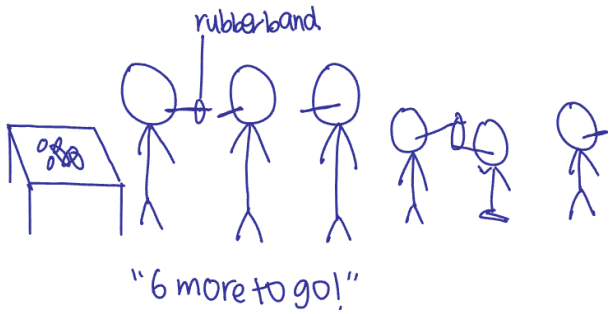
PART II

SCIENCE GAMES

Game 25: Rubber Banding



Transfer the rubberbands from one end to another in the shortest time possible by putting a straw in their mouth and using it to transport.

ELEMENTARY

Leadership Game 25: Rubber Banding

Key Leadership Understanding

Leaders inspire others around them to work together to achieve a common goal.

Math/Science Concepts Applicable

Centre of gravity

Equipment/Logistics

Rubber bands
Straws

Time Required

20 minutes

Game Objective

Be the group to transfer a fixed number of rubber bands while standing in a line within the shortest time possible.

Group Size

About six to eight (but can be changed accordingly)

Procedure

Each group member is supposed to have a straw in his or her mouth and transfer all the rubber bands down the line as a group. The group is supposed to accomplish the task within the shortest time possible without

using their hands to support the straws or come in contact with the rubber bands.

Possible Variations

Instead of transferring rubber bands, the group could instead transfer table tennis balls using plastic spoons. The concept is similar but it is definitely harder!

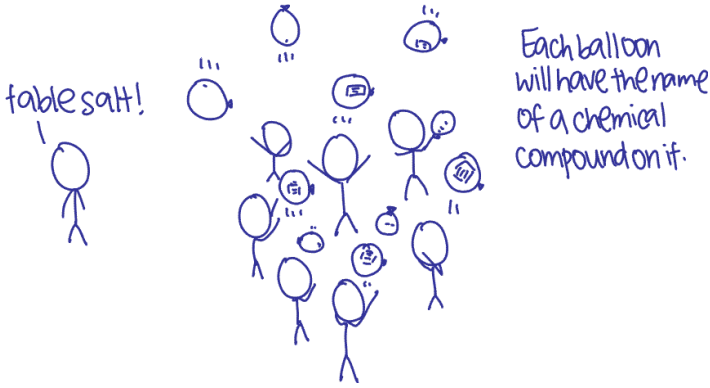
Process

- What difficulties did you encounter throughout this activity?
- How did you feel when the rubber band dropped?
- Did you feel comfortable about this activity? Why?
- How could you improve the next time?
- Could you work within the limited preparation time?

Practical Application

- What can we do to move our team forward?

Game 26: Biodiversity



When that chemical compound is called, make sure that the balloon with that chemical compound is thrown higher up than the rest.

ELEMENTARY

Leadership Game 26: Biodiversity

Key Leadership Understanding

Leaders identify different groups and individuals and support diverse community.

Math/Science Concepts Applicable

Biodiversity and ecosystem

Equipment/Logistics

100 multi-coloured blown up balloons
Marker pens
20 balloons per group of 10 participants

Time required

20 minutes

Game Objective

Be the last group to keep afloat balloons with the compound names on them

Group Size

10

Procedure

Assemble the group in one large circle. Have balloons with the chemical compounds written on them. Balloons of different colours are thrown into the circle. The group has to continue tossing the balloons to keep the

balloons afloat. Whenever the compound name is mentioned, the group will have to make sure that the balloon is tossed higher than the rest. If the compound balloon touches the floor, the group forfeits the game.

Process

- How did the activity make you feel? Was it challenging to keep the coloured compound balloons afloat? Why?

Practical Application

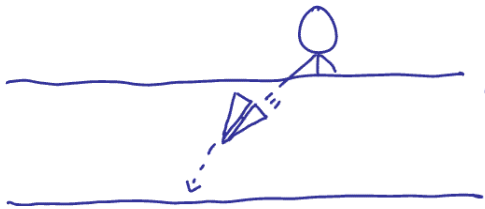
- Imagine if the coloured compound balloons were foreign teammates in your group. Did the support these coloured compound balloons got in the activity reflect the support the foreign teammates get in your organisation? Did any of the balloons burst? How is that similar to peer-pressure given in opposing directions?
- What should group leaders do to support foreign group members?
- What can we do to make sure that our campus or leadership group does not become elitist or divisive?
- What are the reasons we use to reject people or refuse them an opportunity to participate?

Game 27: Boeing or Airbus?

1. Each team is given 2 sheets of A4 paper to fold paper planes with.

2. The objective is to fold the paper plane such that it flies the longest distance possible

3. After folding, each team sends a representative to the starting point to fly or release the aeroplane.



ELEMENTARY

Leadership Game 27: Boeing or Airbus?

Key Leadership Understanding

Leaders set the course for others. Leaders soar with a well-designed plan.

Math/Science Concepts Applicable

Aerodynamics; Knowledge of streamline body and airflow; Knowledge of the projectile motion

Equipment/Logistics

A4-sized paper
A big open space

Time Required

20 minutes

Game Objective

Fold a paper plane and fly it in such a way that it covers the longest distance possible.

Group Size

Six to eight

Procedure

Give each team two pieces of A4-sized paper and let them know the objective of the game. They are then given five minutes to discuss what would be the best way to fold the airplane such that it achieves the objective.

When the time limit is up, one representative from each team will proceed to the same starting point which could be on level ground or on a slope. All the representatives will fly their plane at the same time. The winner is the group whose paper airplane covers the longest distance.

The whole process is repeated so players can modify and improve their folded planes. The overall winner will be the group with the greatest number of wins.

Possible Variations

Instead of the longest distance, other indicators (e.g., amount of time it stays airborne, etc.) can be used as well to award points.

Alternatively, we can also have a dartboard where players use the planes to hit various places at the dartboard to try and get points. The closer the plane is to the bull's eye, the higher the points they receive, and the group with the highest number of points wins.

Process

- How did you feel about the activity?
- How did the different factors affect the flight of the plane?
- How did you decide which was the best way to fold the airplane such that it would achieve the objective in the best way possible?
- Was there a clear leader who directed the process?

Practical Application

- What do we do in the event that our plans go awry?

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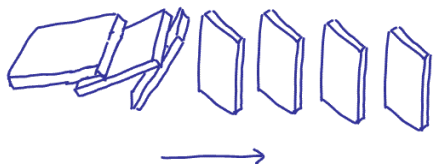
Game 28: Mahjong Dominoes!

1. Everyone lines up and takes turns lining dominoes.

2. The dominoes will then be touched and the team with the most number of dominoes that fall wins.



ELEMENTARY

Leadership Game 28: Mahjong Dominoes!

Key Leadership Understanding

Leaders work for the long term benefit of the organisation.

Leaders influence others and make a positive difference.

Math/Science Concepts Applicable

Conversion of energy

Time Required

40 minutes

Equipment/Logistics

A set of mahjong tiles

Game Objective

Be the greatest number of tiles

Group Size

10 to 15

Procedure

Divide the group into two teams. Every player in each team is given four dominoes.

The first player from each team runs to the counter with their four dominoes and sets them upright on the floor (or with the tiles on top of each other) in a straight line. They run back and tag the next team member, who runs

forward to do the same. This continues until all members of each team have placed their dominoes upright. The last player in the team will touch to trigger the fall of the dominoes that have been lined up in a straight line.

The team with the greatest number of dominoes that fall wins.

Possible Variations

Cards can also be used in place of tiles, such that each team forms a card tower.

Process

- What was the most challenging part in the game?
- How did you feel when the tiles dropped? Did you feel as if your work was demolished?

Practical Application

- Imagine the wall built is the work of leaders. What lessons do you learn about leaders in this game?
- What kind of high standards are we asking others to maintain?

Game 29: Broken Telephone Line/Fax Machine

1. Group members stand in a line, spread out from each other.

2. The 1st person will be given a list of scientific terms.

3. Try to communicate these terms down to the last person.

ELEMENTARY

Leadership Game 29: Broken Telephone Line/Fax Machine

Key Leadership Understanding

Leaders provide the vision and rally support from others.

Math/Science Concepts Applicable

Scientific concepts depending on the terms used

Time Required

10 to 15 minutes

Equipment/Logistics

Cards, each with a different scientific term (e.g., oxidation, apoptosis, etc.) written on it

Game Objective

Be the group to provide the most accurate depiction of the term

Group Size

Eight to ten

Procedure

All players have to line themselves up in one straight line. No talking is allowed.

The players will elect a leader among themselves to go forward and receive a stack of cards with the scientific terms to be communicated. The leader

will then have to commit all the terms to memory, and pass on the terms to the next member of his or her group. This process continues with each member receiving and passing on the list of terms to each other.

The last person in the line will have to reproduce the list to the facilitator. This list will be compared against the original list given to the team leader. Points can be awarded based on how similar the end message is to the original.

Possible Variations

Instead of passing down scientific terms, the leader may receive a picture depicting a scientific process going on. He or she will then have to draw on his team member's back, and this drawing is passed on. The last member will have to guess what scientific process is occurring.

Facilitators must ensure no talking while members are passing the message.

Process

- What difficulties did you encounter during this activity?
- What did you do when you were unsure of what the message that was being passed down was?
- How did you think you fared when doing this activity? Could you have done better?

Practical Application

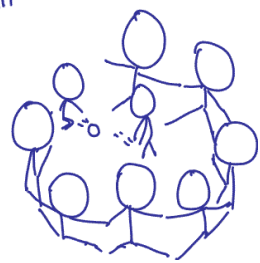
- What facets of good communication do you see being demonstrated here?

Game 30: Circle of Influence

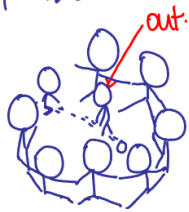
1. Team members stand in a circle with their feet touching each other's.

2. The opponent tries to roll the ball through the legs of the persons making up the circle.

3. Hands can be used to stop the ball.



4. When the ball goes through, the player is out.



ELEMENTARY

Leadership Game 30: Circle of Influence

Key Leadership Understanding

Leaders build their circle of influence as they become the centre of an individual's life.

Math/Science Concepts Applicable

Human reaction time when the environment changes

Equipment/Logistics

Soccer balls

Time Required

20 minutes

Game Objective

Be the group with the least number of balls out of the circle

Group Size

Eight to ten

Procedure

Have each group of players form a circle with their legs spread out so that their feet are touching those of the players on either side. One player from the opposing team will be in the centre with the ball. The goal of this opposing player is to get the ball out of the circle. Players forming the circle are not allowed to move their legs, but they could stop the ball with their

hands from going through their legs. Once the ball gets through a player's legs, that player is out of the game.

As the number of players forming the circle reduces, the circle will get smaller and smaller until the group size is down to two players at which point the game ends.

The game tests the players' reaction time to the ball coming at them from the opposing team player.

Process

- How did you feel when the ball went out of the circle?
- How did you feel when you were in the centre of the circle?
- Were you able to help your teammates prevent the ball from getting out of the circle?

Practical Application

- What is the value of getting everyone involved and opening up opportunities for greater contribution?
- If the circle represented the leadership circle, how can you strengthen the team each time it is reduced in size?

Game 31: The World's Your Oyster

1. Each team is given a list of scientific terms.

2. Using whatever resources available, find out the definitions of these terms in the shortest possible time.

INTERMEDIATE

Leadership Game 31: The World's Your Oyster

Key Leadership Understanding

Leaders search out of the box to find new things. Challenging the boundaries to improve processes and exploration are key leadership skills.

Math/Science Concepts Applicable

Biology terms

Equipment/Logistics

Library
The Internet
*V*arious posters and signs
Participants' work
Paper and pencils

Time Required

30 minutes

Game Objective

Be the first group to figure out the definition of various scientific terms

Group Size

Two to three

Procedure

Form groups of two to three participants and have the groups search library books, the Internet and every possible source to find out about the scientific terms. Contest could be held to see who is the most successful group in searching for all the categories of words. You could offer some prizes to encourage careful searching.

Process

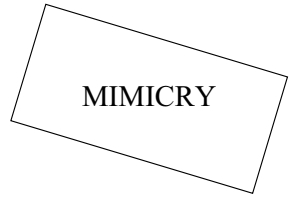
- What feelings did you experience when you did the search?
- What source of information proved most useful for you? Why?

Practical Application

- What does this activity show you about the importance of searching as a leadership practice?
- Why do some of us not challenge the boundaries? What situations around us are we avoiding or afraid to confront?
- What are the biggest obstacles to overcome in taking action?

SOME POSSIBLE/SUGGESTED SCIENTIFIC TERMS

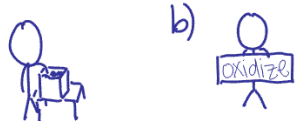
Natural Selection
Femur
Exoskeleton
Endocrine system
Fimbria
Oxytocin
Ecosystem
Ornithology
Zoonosis
Golgi apparatus
Start codon
Phospholipid bilayer
Mimicry
Phagocytosis
Endoparasite
Distal Tubule
Synapse
Carpel
Bacteriophage
Monocotyledon
Beta-Carotene
Apoptosis



Game 32: Once upon a Time

1. Pick a scientific term from the box.

a) b)



2. Write a song/story/rap using that scientific term.

3. Perform it!

INTERMEDIATE

Leadership Game 32: Once upon a Time

Key Leadership Understanding

A leader sees opportunities and angles where others cannot or do not.

Leaders understand the importance of creativity as a key skill in inspiring the vision for others.

Math/Science Concepts Applicable

Scientific terms

Equipment/Logistics

Paper and pencils
Collage paper

Time Required

30 minutes (15 minutes of preparation and 15 minutes for presentation)

Game Objective

Be the group to devise the most creative story with a given scientific term

Group Size

Three

Procedure

Each group will pick a card with a key scientific term. (See activity in Game 7: The World's Your Oyster.) Each group has to tell a story or write a story/

poem/rap with the use of the term. The winning team will be one rated the most creative by the teacher.

Process

- What challenges did you face when devising the story?
- Did you try to do something different? How?
- What does this activity show you about creativity as a leadership trait?

Practical Application

- How do we help others to become more creative?
- How are you setting the course for your team as a leader?

Game 33: Nervous Pulses

1. Facilitator shows a representative from both groups a number.

2. Representative finds a way to transmit the message to the person at the end of the line without talking.

clap x2

3. Person at the end of the line will take out that specified number of ping pong balls from the bucket.

INTERMEDIATE

Leadership Game 33: Nervous Pulses

Key Leadership Understanding

Leaders are patient with others. Leaders listen to good advice and communicate accurately.

Math/Science Concepts Applicable

This is a simulation of how nerves work. Once an organ senses something, the nerves will send a pulse to the brain, and back to the organ or other parts of the body. In this game, the person at the back has received information, and will have to send pulses in any form (except verbally) to pass the information down to the person in front.

Equipment/Logistics

Ping pong balls

Time Required

Five minutes per round

Game Objective

Be the fastest group to pass the message most accurately

Group Size

10 to 20

Procedure

Two groups of participants will sit in a line parallel to each other. In between the two rows, a bucket of ping pong balls will be placed. The facilitator

will flash a number to the last person of both rows. They will then have to utilize any way except verbal communication to pass down the message to the person in front. When the message is passed down, the person in front has to take the specified number of ping pong balls from the bucket. The fastest and most accurate group (with ping pong balls closest to the number flashed) wins.

To determine the fastest group, facilitators can consider the following:

Assuming the bucket has n number of balls,
the range of numbers should be from $\{[0.5 \times n] + 1\}$ to n.

Process

- What were some factors that determined the group's success or failure?

Practical Application

- Do you think verbal communication will be more effective in this case? Why?
- What aspects of good communication do you see being demonstrated here?

Game 34: Group Obstacle Race

INTERMEDIATE

Leadership Game 34: Group Obstacle Race

Key Leadership Understanding

Leaders show perseverance and utilize the strengths of their team members.

Math/Science Concepts Applicable

Dependent on science questions posed

Equipment/Logistics

Ropes and cones (to be set up)
Strings
Set of science questions

Time Required

15 minutes

Game Objective

Complete the obstacle race in the fastest time possible

Group Size

Eight to nine

Procedure

Group members must complete the obstacle race together and cross the finish line together. Ropes can be raised for the whole group to jump across them at one go. Cones can be placed such that the group has to walk in a different manner. Ropes can also be raised for the whole group to crawl

underneath them. The whole group must be tied up together with strings so that they can "stick together".

At each obstacle, the group members will have the option of whether they want to bypass it or overcome it. If they choose the former option, they will be given a science question which they must answer within 10 seconds.

Forfeits can be given if group members split up, do not carry out the tasks correctly, or fail to answer the questions.

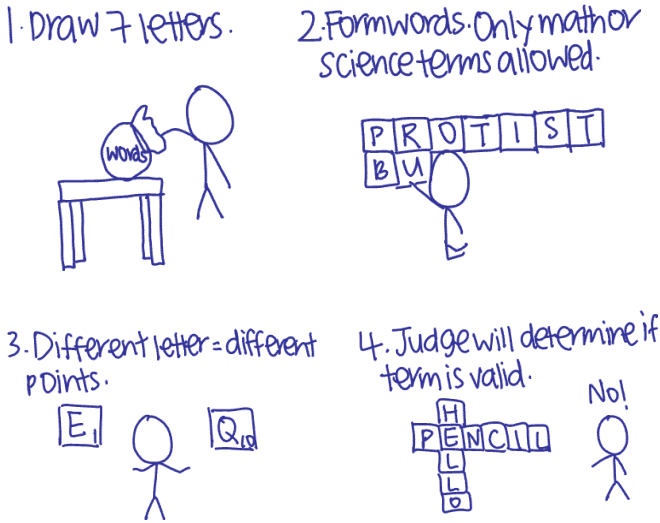
Process

- Did you feel uncomfortable being tied together? Why or why not?
- Was there a leader that could give directions? Or were there too many?
- What was the main difficulty in this game?

Practical Application

- How does teamwork come into play in this game?
- Which is the most difficult situation you are currently facing, where it might be easy to get discouraged?
- What takes teams so long to recognise the true extent of their problems?

Game 35: Scientific Scrabble!



INTERMEDIATE

Leadership Game 35: Scientific Scrabble!

Key Leadership Understanding

Leaders learn to strategize with others (teammates within and external parties) to deliver results.

Math/Science Concepts Applicable

Mathematical and scientific terms; Addition skills

Equipment/Logistics

Scrabble board
Scorer and score sheet
Judge

Time Required

One hour

Game Objective

Be the group to attain the highest score possible at the end of the game

Group Size

Three to four with a total of four groups.

Procedure

Each group plays "scientific" scrabble. The game is played as a team rather than as individuals. Like Scrabble, players from each team will draw seven letters from a bag and form words on a scrabble board. The time limit

for each turn is five minutes. Each letter has a different numerical score. Therefore, each word will have different summative scores.

Only mathematical or scientific terms are allowed (e.g., *biodiversity, pi, beta-carotene,* etc.). The judge decides whether or not the word used is scientific. Teams are allowed to explain and appeal. However, the judge's decision is final.

The team with the highest score wins.

Process

- Were you exasperated when your team members did not take up your suggested formation of words?
- How did you feel when your team won/lost?
- Would you have strategized each formation differently?
- Was communication effective among team members in the game?

Practical Application

- What principles are involved in good communication and teamwork?

Game 36: Murder Mystery

INTERMEDIATE

Leadership Game 36: Murder Mystery

Key Leadership Understanding

Teamwork materialises the group's dream or vision.

Leaders need to have a good listening ear and be receptive to the opinions of team members before making any decisions.

Math/Science Concepts Applicable

Forensic science and logical deductions

Equipment/Logistics

Magnifying glass
Paper
Stamp-pad
Shoe print and thumb print of "murderer"
Shoe print and thumb print of the "victim"
Six or more players as "suspects" (one to function as the "murderer", one as the "victim" and the remaining four as extras).
Six or more hideouts for each of the "suspects"

Time Required

One hour or more

Game Objective

Be the first group to deduce correctly who is responsible for the "crime"

Group Size

Five to six

Procedure

The main objective of this game is for a group to work together as detectives to solve a murder mystery, using the clues given to them.

The six or more "suspects" will be assigned to different hideout locations. Two sets of thumb and shoe prints (one set belonging to the "murderer" and one set to the "victim") will be given to each group which has to conduct an investigation to trace the "murderer" and "victim". Players have to search out all the "suspects" and devise creative ways to obtain the "suspects'" thumb and shoe prints. Each "suspect" will decide whether the approach is creative enough for him or her to allow the prints to be given to the group.

The fastest group to solve the mystery wins.

Process

- Was it tiring to carry out the same checks over and over again for the various "suspects"?
- Could this problem be solved or made less problematic?
- Did everyone put in an effort to solve the mystery or was it just a small group doing all the work?
- Did your group work in pairs or as a group when you conducted your investigation with each "suspect"?

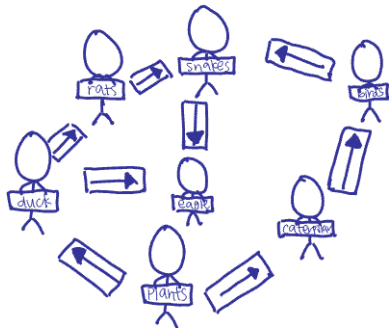
Practical Application

- How much do you contribute to your team?
- Do others consider you a team player?

Game 37: Food Web

1. Each person is given a card with an organism written on it.

2. With all these organisms, form a food web.



3. If organisms are taken out, there may be a need to redo the food web to fit the circumstances.

INTERMEDIATE

Leadership Game 37: Food Web

Key Leadership Understanding

Leaders encourage participation among members within the group and inspire all to work towards a common goal.

Leaders can be both models and followers.

Math/Science Concepts Applicable

Ecology

Equipment/Logistics

Cards, each with the name of an organism (all the organisms must be related in a food web).
Stopwatch

Time Required

15-20 minutes

Game Objective

Aim to involve every team member in the food web

Group Size

Five to six

Procedure

Organism name cards will be distributed to the group members indicating the role each has to play. All the members must be involved to form a gigantic food web. The facilitator has to time how long they take.

Upon completion of the first food web, the facilitator has to proof-read the food web to ensure it is logical. The facilitator will let the group know how long they had taken to complete the first food web.

Next, the facilitator will then remove a couple of "organisms" or members from the food web and get the group to create a food web again. The team will explain to the facilitator the relationships in the food web they have formed.

The aim of the game is to challenge players on how to reposition themselves each time some "organisms" are taken out.

Process

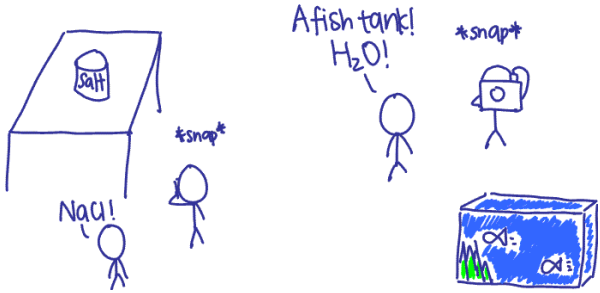
- What was the main difficulty in this game?
- Was every member important?
- When a couple of "organisms" were removed from the "food web", what impact did that have on the remaining "organisms"?

Practical Application

- In what ways are food webs similar to how a team functions?
- Are we the "predators" or the "prey" in our organisation?
- When some members are taken away, how does that impact a team? How do we respond under such a circumstance?

Game 38: Cam the Chemicals!

Take photos of things that best represent the chemical names given to you.



INTERMEDIATE

Leadership Game 38: Cam the Chemicals!

Key Leadership Understanding

Leaders bring others into the picture and galvanise the team to achieve results.

Math/Science Concepts Applicable

Atomic structures

Equipment/Logistics

Piece of paper with molecular or atomic structures written on it
Camera
Laptop

Time Required

About one hour

Game Objective

Determine the materials that make up a given chemical structure

Group Size

Five to six

Procedure

Players are to bring their own cameras and laptops. Each group will receive the piece of paper with molecular structures. Players can use the Internet to figure out the materials that make up the molecular structures.

Once they find out what materials the structures represent, they are to go around the compound or environment to scout for these materials to take pictures of them. The first group to finish the task with the least number of mistakes wins.

Possible Variations

Certain restrictions might be imposed to make the game more challenging. For example, instead of researching on the Internet, they are given only a chemistry textbook.

Process

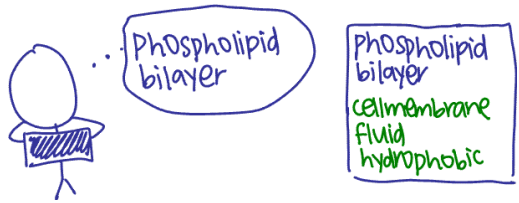
- How did you allocate your time given that you had one hour?
- What was the role each member played in the whole activity?
- How did you find your performance both as a group and as an individual player?

Practical Application

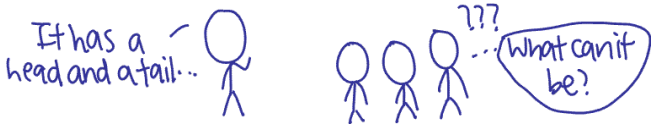
- When you are unsure about the work you have been assigned to, what do you do?
- What situations are you facing right now that require more support?

Game 39: Taboo!

1. A player from the group will receive a scientific term with three words that he/she is not allowed to say.



2. He/she has to describe the term to the teammates and they have to try guessing the term.



INTERMEDIATE

Leadership Game 39: Taboo!

Key Leadership Understanding

Communicating your vision clearly is a critical aspect of effective leadership.

Math/Science Concepts Applicable

Scientific terms and concepts

Equipment/Logistics

Cards, each with a scientific term or concept and indicating three (taboo) words which are closely related to the term/concept

Time Required

About one minute per player

Game Objective

Explain a scientific term or concept without using certain words for teammates to guess the term or concept given

Group Size

10 to 20

Procedure

Players take turns to receive a card with a scientific term or concept on it. He or she is to describe the term or concept as vividly as possible for the rest of the players to guess at the term. However, the three words written on the card are meant to be taboo and are not to be uttered while describing

the term or concept. The player forfeits his or her turn when the taboo word is spoken.

If the player finds the term on the card too difficult to describe, he or she can request for a change up to two times.

Process

- All of you had a chance to describe a term. How did you feel when your teammates could not guess correctly?
- When all of you were guessing the term, how did you feel when time was running out and you could not get the correct answer? Did you feel annoyed when repeated answers were given?
- Did you blame your peers for not being descriptive enough or did you encourage them?

Practical Application

- What are we doing to build team unity and confidence?

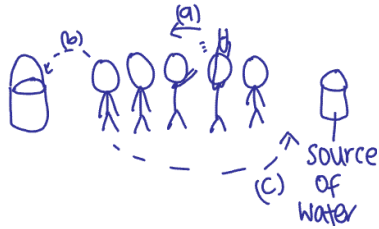
Game 40: Bob the Builder

1. Pass a test tube containing water from the front of the line down:

2. The last person pours the water into a bucket at the end of the line.

3. He/she runs to the start of the line, and the cycle starts again.

4. Overall setup:



INTERMEDIATE

Leadership Game 40: Bob the Builder

Key Leadership Understanding

Leaders build legacies. Leaders never pass an empty mug to the next.

Math/Science Concepts Applicable

Physics concepts such as gravity and fluid dynamics

Equipment/Logistics

Test tubes
Raffia string
Tape
Rubber bands
Buckets
Water

Time Required

30 minutes

Game Objective

Be the group that obtains the largest volume of water in the bucket

Group Size

Six to eight

Procedure

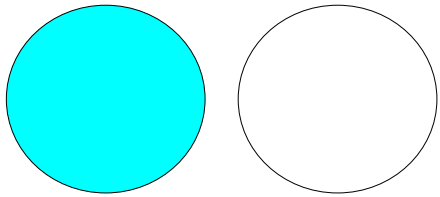
Each group of players is to stand facing each other's back in one line. Each group is given a test tube and a large bucket of water placed at point A.

The goal is to transport as much water as possible from the bucket at point A to point B. Players take turns to scoop the water with the test tube and pass it overhead to the player behind until it gets to the end of the line. The last player to receive the test tube pours the water from the tube into an empty bucket. He or she then runs to the front of the group, and repeats the process until a given time is exhausted.

The group to transport the largest volume of water wins!

Possible Variations

A possible variation of the game could be to place two buckets side by side. One of the buckets is filled with water. Players are not to step within 1.5m radius of the buckets.



Players are to make use of all the logistics given to create a method to transfer water from the filled bucket to the empty bucket within a given time. If less than half of the empty bucket is filled, players will have to do a forfeit as it implies that their "invention" or method of transporting the water is not efficient enough.

Process

- If you were to do this again, what would you do differently?
- What did you do to ensure that you spilled as little water as possible?
- How did you feel about the amount of water in the test tube when it was first handed to you?

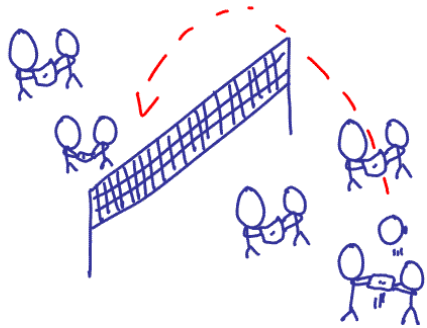
Practical Application

- If the test tube represents your predecessor's work, how do you feel about work left over for you to take over?
- Was the bucket half full or half empty? How will others perceive the work that you leave behind?
- What is succession in leadership? What role can you play to ensure good succession?

Game 41: Water Bomb Volleyball

1. Each team will have their group members paired up, with a garbage bag between each pair.

2. Use the garbage bag to fling the water bombs over the net to the opponent's side.



3. The opponents try to receive the bomb using the garbage bag. If they fail to do so, the attacking team gets 1 point.

Team with most number of points wins.

INTERMEDIATE

Leadership Game 41: Water Bomb Volleyball

Key Leadership Understanding

Leaders observe changes to circumstances and adapt well.

Math/Science Concepts Applicable

Estimation of forces

Equipment/Logistics

Garbage bags
Towels
Water bombs
Net

Time Required

30 minutes

Game Objective

Be the group to score as many points as possible while preventing the other team from scoring

Group Size

Eight

Procedure

Each team is separated by a net. Each team will have their group members paired up, with a garbage bag between each pair. The objective of the

game is to use the garbage bag to fling the water bombs over the net to the opponent's side.

If the water bomb falls to the ground and bursts, the team that throws the water bomb gains a point. If the opponent pair manages to catch the water bomb with their garbage bag, the opponent pair gains a point. Within each team, the water bomb can be passed around.

The team with the highest points in the given time wins!

Possible Variations

Other items other than water bombs can be used, such as a beach ball, etc.

Process

- How did you feel when the water bomb burst?
- What was essential for this activity to be a success?
- Did you have problems communicating with your team members so that the roles can be evenly distributed out? (e.g., the positioning of pairs, etc.)
- Given a chance to repeat the activity, what would you have done differently?

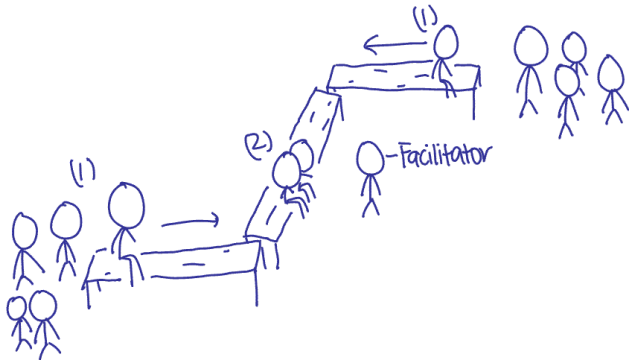
Practical Application

- What does this activity tell us about a leader's role in such a circumstance?

Game 42: Swoosh!

Bird's eye view of chairs.

1. Person from each team tries to slide across chairs as fast as possible.
2. Facilitator gives them a science question when they meet.



3. Try to answer as fast as possible. Winner gets to continue sliding, loser sends out another person.
4. Team with group member that reaches the end of the bench wins!

INTERMEDIATE

Leadership Game 42: Swoosh!

Key Leadership Understanding

Leaders set the pace for everyone and keep the momentum going in the team.

Leaders encourage one another.

Math/Science Concepts Applicable

Forces of friction

Time Required

15 to 20 minutes

Equipment/Logistics

Three benches
Soap water
One pail
List of science questions

Game Objective

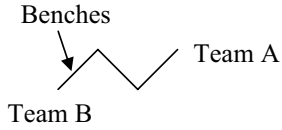
Be the group to score as many points as possible by answering the science questions in the shortest time

Group Size

20

Procedure

It would be good to carry out this activity in an outdoor court. Benches will be set up in the format below:



Soap water will be splashed on the benches to make the surface slippery.

Each team will have to send out one member at a time to slide themselves on the benches as fast as possible. The players will start in opposite directions. At the point when two members of the different teams meet, the facilitator will ask the two members a science question. The first player to answer the question correctly is allowed to continue sliding on the bench heading towards the opposing team. The player who could not answer the question fast enough will then have to come off the bench immediately so that another member of his team can start sliding to meet and prevent the "winner" from going further.

The aim is to reach the end of the benches at your opponent's end to score a point for your team.

The team that has the most number of players at the other end wins!

Process

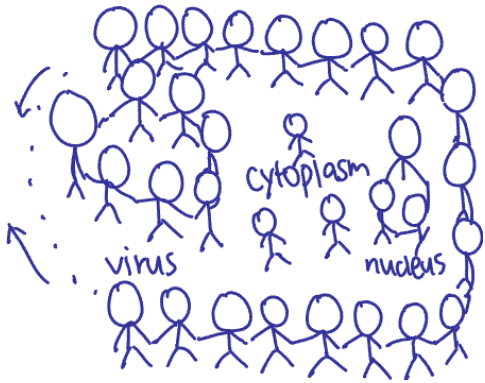
- Why did you think you won or lost the game?
- Was there any strategizing involved in this game?
- Did you play the game as fairly as you could?

Practical Application

- What are the strengths and weaknesses of your team?
- What are the ways we can encourage others to help them reach their goals?

Game 43: Leucocytes

Try to form a cell with its parts (e.g. nucleus, cytoplasm etc) as well as a "virus". Try to engulf the virus of another group while protecting your own virus.



White blood cell engulfing virus.

INTERMEDIATE

Leadership Game 43: Leucocytes

Key Leadership Understanding

Leaders care for his or her team members throughout the journey.

Leaders embrace diversity.

Math/Science Concepts Applicable

Cells and viruses

Time Required

20 minutes

Equipment/Logistics

A big open space with a marked out boundary

Game Objective

Be the group that successfully protects their own virus

Group Size

20 to 30

Procedure

Divide group of players into Teams A and B. All the players must form a cell with its parts (a few players to represent the virus, cytoplasm, cell membrane, white blood cell or the nucleus). Both teams will need to strategise their plan to engulf the "virus" members of the opposing team.

There should at least four "virus" members and the number of such members must be equal in each team.

All the players will be stationed in the marked out boundary area. Team A and Team B will each offer and place a "virus" member in the centre of the boundary area. When the facilitator starts the game, teams will rush to the centre to attempt to capture the opponent "virus" member while protecting their own "virus" member from being captured.

This game will continue until only one "virus" is left. The team with the remaining "virus" wins!

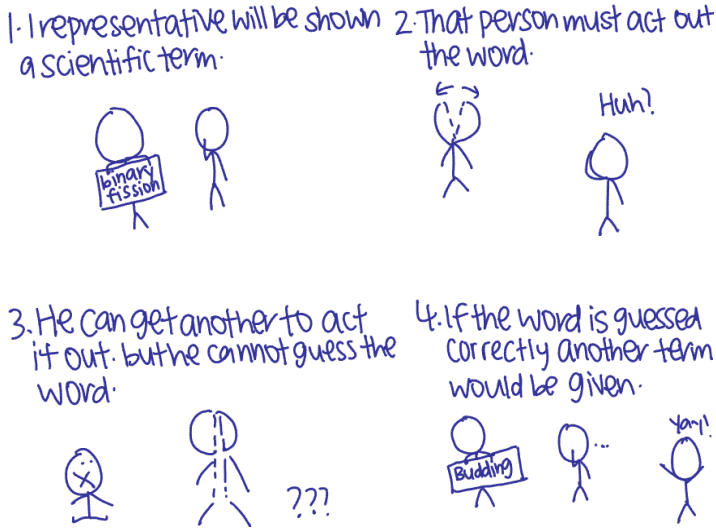
Process

- What was the most essential factor that allowed you to complete the game?
- How did this game show you the importance of communication and cooperation with other team members?

Practical Application

- What kind of situations calls for encouragement to be given and how can we best provide it?
- Was it easy to embrace your opponent's "virus"? How could we improve our ability to embrace differences in others?

Game 44: Charades



INTERMEDIATE

Leadership Game 44: Charades

Key Leadership Understanding

Leaders communicate well and think out of the box. Leaders persevere in the face of challenges.

Math/Science Concepts Applicable

Knowledge of scientific terms

Equipment/Logistics

List of scientific terms (e.g., Hall effect, etc.)

Time Required

Five minutes per team (total time is dependent on the number of teams playing)

Game Objective

Be the group to guess correctly as many terms as possible within a stipulated time (e.g., one minute)

Group Size

Five

Procedure

Each team will send out one representative. The representative will be shown a scientific term. He or she has to act out the term for team members to guess what the term is. The representative is not allowed to talk or write. Once the word is guessed correctly by team members, the representative will then be given another term to act out.

If the representative is unsure of how to act out the term, he or she can choose to pass it to another team member to replace him. However, he or she is not eligible to guess that word anymore. Alternatively, the representative can choose to skip a term and ask for another term to act it out.

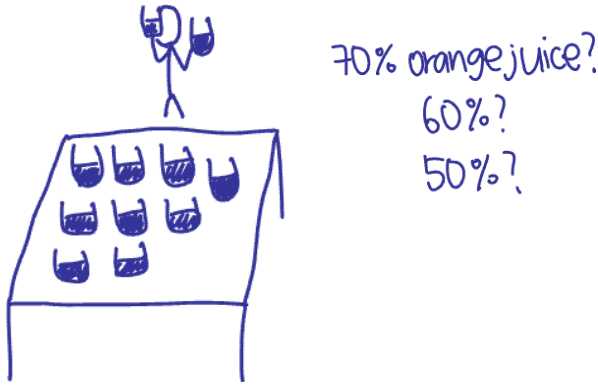
Process

- How did you (the person acting out the words) feel when you were unable to transmit the message effectively to your teammates?
- How did you (the rest of the team) feel when you were unable to guess the terms?
- Were there other ways which you could have helped the transmitter? (e.g., asking questions, etc.)

Practical Application

- When do boldness and honesty in communication create problems for the team?

Game 45: Drinks for Life



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Leadership Game 45: Drinks for Life

Key Leadership Understandings

Leadership involves prioritising.

Leaders understand that their ideas and choices affect others.

Math/Science Concepts Applicable

Observation and deduction

Equipment/Logistics

Four types of liquids – cola with phosphoric acid, vinegar with acetic acid, sodium chloride with salt and sodium carbonate with baking soda

Time Required

30 minutes

Game Objective

Be able to guess the composition of liquids used in a mixture

Group Size

Four to six

Procedure

In groups of three, players will be given four liquids. Each group will select any two of the liquids to create a unique mixture.

Before they create their mixture, they will have to guess what will result from their mixing. Will there be a precipitate? They would need to state the colour and taste (e.g., sour, sweet, acidic, etc.) of their mixture.

After each group has completed making a guess, they will proceed with the mixing. The group will then compare the outcome of the mixture with what they have inferred prior to the mixing.

The facilitator will allocate some time for each group to share how they came to their inferences and how did the outcome differed from their inferences.

Process

- How did you feel when you were making the unique drink?
- Was it easy or difficult to make the selection of liquids to be used in the mixture? Why or why not?
- What happened to the original liquids after they were mixed?

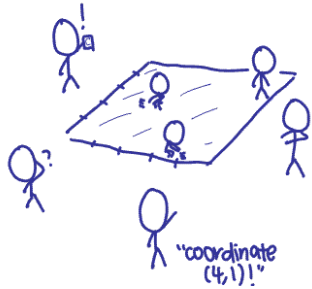
Practical Application

- What guides you in making choices?
- Why is it difficult to make a choice at times?
- What effect do our decisions make on the lives of others?

Game 46: Treasure Hunt

1. Decipher the coordinates given based on the list of clues given to you.

2. Find the cards hidden at that particular place as described by the coordinate, buried in the sand.



3. Each card has a letter. Piece it to solve the motto together.

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Leadership Game 46: Treasure Hunt

Key Leadership Understanding

The true treasures lie in the qualities of each member in the team. Leaders encourage and motivate others in search of such treasures or qualities.

Math/Science Concepts Applicable

Science based concepts

Equipment/Logistics

Pieces of cards, one with each letter (all the letters will eventually form a word that highlights a particular theme or concept, e.g., the letters *u, n, i, t, y* for *unity* in leadership)
Sets of coordinates
List of scientific questions for each group to solve in order to have the coordinates
Sandpit where the cards can be buried
One game master for each group to assign the numerals for each correct answer

Time Required

More than an hour (depending on the difficulty level of the questions)

Game Objective

Be the first group to successfully piece the letters to form the theme

Group Size

Six to eight

Procedure

On the sandpit, facilitator will mark out the coordinates and bury the pieces of paper with the letters in the sand in each of the coordinates to be deciphered.

Provide each group with the same list of questions where each answer points to a single number. The groups will need to answer the questions in order to find the numerals, and piece them together to form sets of coordinates.

For instance, the theme "United in Leadership" involves 18 letters all of which will be buried in the sandpit. The entire list of 36 questions is shared equally among the number of groups. Their correct answer to any one question will yield them one numeral. The correct answer to another question will yield them another numeral. These two numerals will form one set of coordinates. Each set of coordinates will lead them to one letter in the sandpit.

NOTE
Every group will receive a unique set of coordinates with each pair of correct answers. The game master for each group will assign the pre-determined sets of coordinates which can be found on the sandpit.

Each group will have the same number of letters which are insufficient to form the word or theme. They will then have to communicate with other groups to pool their letters together.

Possible Variations

Number of letters can be reduced if there is not enough time. Have a shorter form of the theme. Alternatively, the difficulty level of the questions can be made easier.

Process

- Where is the "treasure" in the hunt?
- What challenges did you face in this activity?

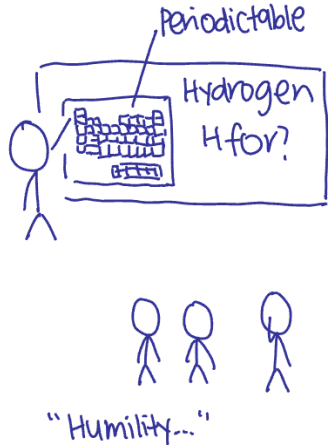
- If you were to do it again, what would you do differently?
- Who was the most encouraging player in the team?

Practical Application

- Which are the difficult situations in your organisation where it might be easy to get discouraged?
- How can we keep people moving forward in changing for the better?
- What conditions are necessary for high performance in a team?

Game 47: Table of Elements

Revise the periodic table to reflect key leadership terms.



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Leadership Game 47: Table of Elements

Key Leadership Understanding

Leaders resolve problems by looking at and perceiving things differently.

Math/Science Concepts Applicable

Natural elements

Equipment/Logistics

Periodic Table of Elements

Time Required

30 minutes

Game Objective

Be the first team to revise the Periodic Table of Elements to reflect key leadership terms

Group Size

Three to five

Procedure

Give group of three participants the Periodic Table of Elements. Participants have to revise the Table to reflect new leadership terms or principles.

Example: *Fe* for *Iron* becomes *Fe* for *Fear*

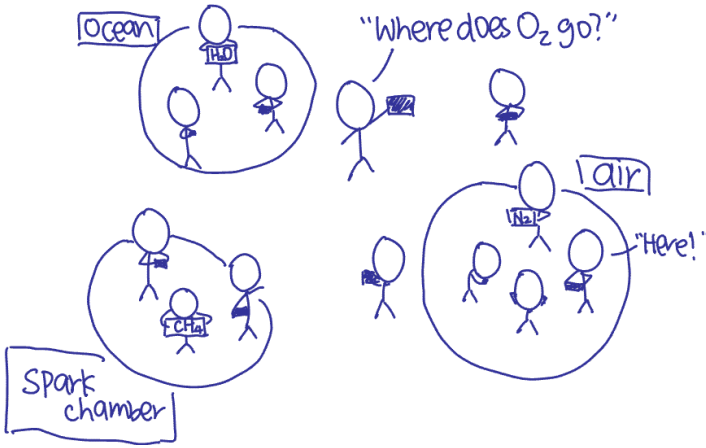
Process

- How did you feel trying to revise the terms?
- What challenges did you face in revising the terms?
- How would you do it differently the next time?

Practical Application

- What does this challenge relate to the difficulties of leaders in managing team effort?
- What are the difficult situations you are currently facing, where it might be easy to get discouraged?
- Which qualities are necessary to press on?

Game 48: Primordial Soup



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Leadership Game 48: Primordial Soup

Key Leadership Understanding

Leaders aim for and set high standards.

Math/Science Concepts Applicable

Chemical compositions

Time Required

30 minutes

Equipment/Logistics

Set of placards A with a chemical symbol (e.g., H_2O on one placard, O_2 on another, CH_4, C, N_2, NaCl, rare gases) on each placard
Set of placards B indicating a percentage (e.g., 7%, 21%, 0.03%, 3.4%, 79%, 96.6%) on each placard (each percentage represents an actual chemical composition)
Set of placards C indicating another chemical symbol (e.g. amino acids, etc.) to serve as distractors
Twine/raffia string (to mark out circles)

Game Objective

Be the first group to come up with the correct chemical composition of the ocean, spark chamber and air

Group Size

Eight to ten

Procedure

Similar to the memory game, all the placards are to be placed face down so that players will have to flip the placards over to view the chemical (A), percentage (B) or distractor (C) symbols. Physically mark out three circles with space big enough for five to six players (one circle to represent the ocean entity, one to represent the spark chamber entity and one to represent the air entity). All placards are to be scattered outside of the three circles.

One member of the team starts the game by picking up a placard, and decides which circle to go into with the placard. One team member is only allowed to enter into the circle at any one point, and can only flip over the placard in the circle. If the symbol on the placard does not fit the circle, the team member must leave the circle and return the placard to its original place. The next team member follows this procedure.

Eventually, the teams would have correctly placed all the placards in the respective circles, with the chemical composition of either the ocean, air or spark chamber.

The facilitator has the answer sheet of each chemical symbol in each of the circle. The fastest team to correctly have the right chemical composition for all the three circles wins. Answers should be scientifically correct.

NOTE
Air = 79% N_2, 21% O_2, 0.03% CO_2 and rare gases
Ocean = 96.6% H_2O and 3.4% NaCl
Spark Chamber = O_2 and CH_4

Process

- Did you have difficulty knowing where each chemical was supposed to be in?
- How did those who know the information communicate to those who do not?
- Did you feel impatient with any group member who might have gone into the wrong circle?

Practical Application

- Are we impatient for results?
- Are we expecting too much from others to attain our high standards?
- Do we feel competent enough to take on a leadership role?
- How do we prepare ourselves as leaders of our team or group?

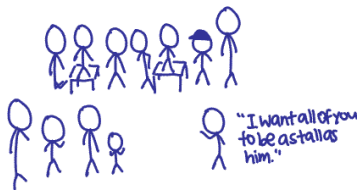
Game 49: Height Equilibrium

1. Start off with 1 person in the arena.

2. Put in another person in the arena.

3. The game master will announce a particular height that the players have to attain either by elevating or lowering themselves.

4. Repeat steps 2 and 3:



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Leadership Game 49: Height Equilibrium

Key Leadership Understanding

Leaders are resourceful and adapt well.

Math/Science Concepts Applicable

Heat transfer generally occurs from a hotter to a cooler object until both objects are at the same temperature. This state is deemed as thermal equilibrium. In this game, all the players are supposed to try and reach a state of "height equilibrium".

Time Required

However long it takes to achieve height equilibrium

Equipment/Logistics

Any physical object (e.g., a chair or table) which could be used as a benchmark for the height required by the facilitator

Game Objective

Be the fastest group to achieve the height equilibrium

Group Size

Six to eight

Procedure

The game starts with only one player from each group assigned to an arena. The Height Almighty (HA) or facilitator will provide a particular height for the player to attain. The player could either squat, sit, stand or

use the available logistics (e.g., a chair or table) given. The team is allowed to introduce the next player only when the HA is satisfied with the height achieved by the player(s) in the arena.

The fastest group to attain "height equilibrium" with all members in the arena wins.

Process

- When some of your teammates were not tall enough, how did you overcome the problem? Do you think it was effective?
- Was there a strategy that you used in this activity?
- What were some of your feelings when you were unable to attain a certain height?
- Do you feel that you have encouraged each other enough?

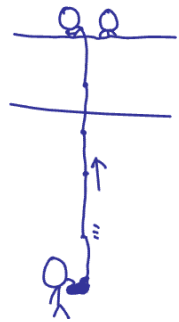
Practical Application

- What kind of members do we want to recruit for our groups or teams to make things stronger or better?
- What plans could we make to achieve what is best for our team?

Game 50: Pull It Up!

1. Groups are given a list of items that they have to transport up to the 2nd storey.

2. Using whatever they have on themselves, they build a pulley-system to transport the items up.



3. The 1st team that transports everything up wins!

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Leadership Game 50: Pull It Up!

Key Leadership Understanding

Leaders communicate through different ways to inspire others in achieving a shared vision.

Math/Science Concepts Applicable

Newton's Second Law in physics

Equipment/Logistics

Strings
Scissors
List of items consisting of things that can be found on players (e.g., shoes, socks, watches, etc.)

Time Required

About an hour dependent on the number of items

Game Objective

Be the fastest group to build a pulley, transfer items according to instructions

Group Size

10 to 12 (five to six members on each level)

Procedure

Each group will be asked to provide a list of items from their belongings. They are given strings, scissors and whatever they have to build a pulley

system. Each team has to split into two, with one group stationed on the ground level and the other on the second level of a building.

The group at the ground level will be given the items which they have to transfer using the pulley system to their team members on the second level.

After all the items have been transferred, the pulley system has to be dismantled and all the members will assemble at the ground level to complete the game.

The fastest group to complete wins.

Possible Variations

Certain communication restrictions, such as no shouting, can be imposed on the team.

Process

- Was it hard building the pulley system? Why or why not?
- Was communication tough? Could there be other means of communication apart from shouting (if shouting was used)?
- How could you do this better the next time round?

Practical Application

- How do we involve reluctant members in meeting the team's goals?