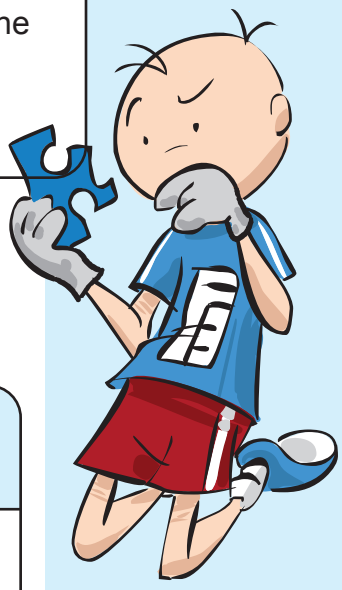
TRAIN LIKE AN ASTRONAUT MISSION HANDOUT

YOUR MISSION: **Crew Assembly**

As a team you will assemble a puzzle quickly and correctly to understand the importance of dexterity and hand-eye coordination; you will also practice communication and problem-solving skills. Observations of your dexterity and hand-eye coordination will be recorded in your Mission Journal.



MISSION QUESTION: How can you perform a skill-based activity that demonstrates the importance of dexterity and hand-eye coordination while practicing communication and problem-solving skills?

MISSION ASSIGNMENT:

Dexterity Skill Training and Problem Solving

You team's goal is to complete your puzzle before the other teams.

- **Relay procedure:**
  - Two crew members will start at home base.
  - Have one crew member be the time keeper.
  - One crew member will open the container of puzzle pieces and distribute them equally to all crew members.
  - After distribution of puzzle pieces, crew members should put on two pairs of gloves. The first pair of gloves should tightly cover the hands. The second pair of gloves will be worn on top of the first pair and should be thicker, for instance ski gloves.
  - Crew members holding pieces labeled "A" will go to their assembly area and assemble the outer edge of the puzzle. They are assembling the puzzle face up, not letters up.
  - Once all the "A" pieces are assembled, all crew member will return to their home base and tag team members.
  - Crew members holding pieces labeled "B" will go to the assembly area and assemble the next layer moving inward of the puzzle.
  - Once all the "B" pieces are assembled, crew members will return to home base.
  - If your team has a "C" puzzle piece and letters beyond, continue piecing together the puzzle in alphabetical order until the puzzle is complete, and all crew members have returned to home base.
  - The time keeper will record how long it took your team to complete the puzzle.
  - Record your time in your Mission Journal and compare with other teams.

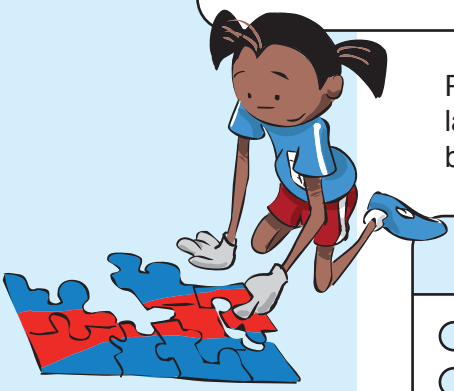
- Record observations before and after this skill-based experience in your Mission Journal.

Follow these instructions to train like an astronaut.

Improvements in dexterity and hand-eye coordination allow easy and quick assembly of objects. It builds muscle endurance while controlling hand movements, which allows the assembly of objects or equipment for a longer period of time without experiencing exhaustion. When you are assembling a bicycle or a detailed object like a model airplane dexterity and hand-eye coordination are important.

It's a NASA Fact:

NASA is developing dexterous robotic hands for an exploration robot named Robonaut that is designed to be used for EVA tasks. Robonaut was designed by the Robot Systems Technology Branch at NASA's Johnson Space Center in Houston, Texas. While designing Robonaut, the central effort was to build a machine with dexterity that exceeds that of a human astronaut. It is imperative that Robonaut have range of motion, strength, and endurance. Robonaut's hands are able to fit into all required places and operate EVA tools. The dexterous hands can maintain a stable grasp while manipulating an object, like a tool. The use of Robonaut with dexterous robotic hands will expand NASA's capabilities for construction and discovery.



People rely on dexterity and hand-eye coordination to add smaller pieces to larger objects during construction; examples include piecing together puzzles, building models, putting together toys or using tools to assemble a product.

Endurance:
Ability to perform an exercise or a physical task over a long period of time.

Dexterity:
Skill and grace during physical movement; especially when using hands to handle pieces or small objects.

Coordination:
Using your muscles together to move your body the way you want.

Fitness Acceleration

- Increase the amount of puzzle pieces per puzzle to 50, 100, 200 or 250.
- Construct your puzzle while your crew members are in another room giving you instructions through radio communication.
- During the relay, trade puzzles with another group and continue their work; completing a puzzle that is different from your original puzzle.
- Create different scenarios by adding creative new rules instructed by your teacher.

Think Safety!

Astronauts must practice assembling devices on Earth so they can successfully assemble objects in space.

- Keep all your puzzle pieces together.
- Avoid uneven surfaces.
- Use communication skills properly.

Mission Explorations:

- Build larger objects using building blocks or connecting pieces.
- Use tools to assemble a bicycle or glue to assemble a model with adult supervision.
- Create something new from recyclable materials such as milk jugs, food containers, or empty boxes.
- Assign country names to the teams working together, modeling after the International Space Station partners. Create a flag to replicate your team's country flag and provide five facts about your team's country on the back of your flag.

Status Check: Have you updated your Mission Journal?