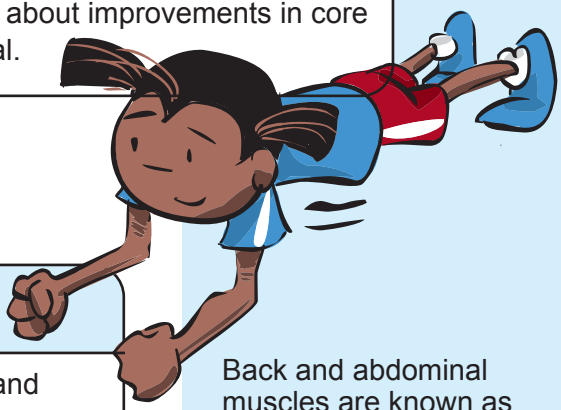
TRAIN LIKE AN ASTRONAUT MISSION HANDOUT

YOUR MISSION: Building An Astronaut "Core"

You will perform the Commander Crunch and Pilot Plank to improve the strength in abdominal and back muscles. As you train like an astronaut, record your observations about improvements in core muscle strength during this physical experience in your Mission Journal.



MISSION QUESTION: How can you perform a physical activity that will improve abdominal and back muscles?

MISSION ASSIGNMENT: Core Strength Training

You will do the following activities with a partner. A warm-up/stretching and cool-down period is always recommended.

- ◯ **Commander Crunches**

  Starting position
  - Lie on your back, knees bent, feet flat on the floor.
  - Chin should be pointed to the sky, arms crossed over your chest.

  Procedure
  - Using only your abdominal muscles, lift your upper body until your shoulder blades leave the ground. Put one hand on your abdomen to feel your muscles working as you raise your shoulders off the floor.
  - Lower your shoulders down using only your abdominal muscles to complete one crunch.
  - At your partners command, begin to complete as many crunches as possible in one minute, timed or counted by your partner.

- ◯ **Pilot Plank**

  Starting position
  - Lie down on your stomach.
  - Resting on you forearms, make a fist with each hand, place your knuckles on the floor shoulder width apart.
  - Using only your arm muscles, push your body off the floor supporting your weight on your forearms and toes.
  - Your body should be straight as a board from your head to your feet.

  Procedure
  - Using the muscles in your abdomen and back, stabilize your body by tightening these muscles.
  - Try to keep this position for at least 30 seconds.

  Switch places with your partner and follow the same procedure.

- ◯ Record observations before and after this physical experience in your Mission Journal.

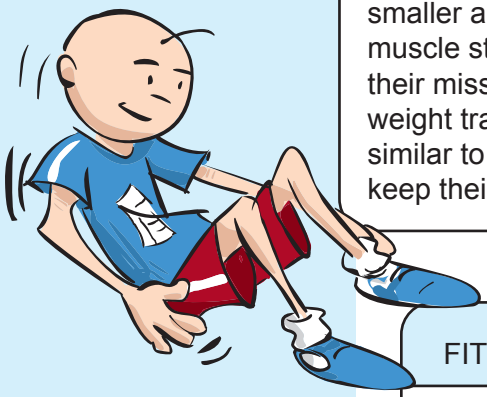
Follow these instructions to train like an astronaut.

Back and abdominal muscles are known as the core muscles. They protect your spine, maintain proper posture, and transfer energy through your body for powerful movements such as swinging and throwing. These muscles work together as you sit up or lie down in bed, turn your body, pick up an object, and stand still. Core muscles also work together to maintain posture while wearing a heavy backpack.

By improving the strength of your core muscles, you will find it easier to stabilize your body, maintain proper posture, and prevent injury. With strong core muscles, you may find that you have better posture, can balance extra weight easier, and you might have better agility for sudden movements during sports activities.

It's a NASA Fact:

Just like on Earth, astronauts in space must be able to twist, bend, lift, and carry things. They must have strong core muscles so they can perform their tasks efficiently and avoid injury. During missions in space they need to bend their body and hold it straight for extended periods of time. Astronaut's muscles get smaller and weaker over time in a microgravity environment. In order to maintain muscle strength they practice core-building activities before, during, and after their missions. Here on Earth, these activities may include swimming, running, weight training, or floor exercises. In space, they use specialized equipment similar to what you would find here on Earth to keep an exercise routine that will keep their core muscles fit for the job.



Core:
The muscles that stabilize, align, and move the trunk of the body; the abdominal and back muscles.

Stabilize:
To keep something at the same level; to maintain that level.

Posture:
A position the body can assume; standing, sitting, kneeling, or lying down.

Repetition:
A motion that is repeated and usually counted.

Forearm:
The part of the human arm extends from the elbow down to the wrist; lower arm.

Spine:
Consists of the spinal cord, vertebrae and discs; supports an animal's body.

FITNESS ACCELERATION: Test Yourself!

- ○ Increase the number of Commander Crunches in one minute.
- ○ Increase the time in which the Commander Crunches and Pilot Plank are performed.
- ○ Repeat the Commander Crunch activity only this time do not cross your arms. While holding the medicine ball over your abdomen, do as many crunches as possible in one minute.
  Safety: Do not rest the medicine ball on your abdomen. Also, be sure your partner is close by in case you need assistance.
- ○ Repeat the Pilot Plank activity only this time, extend one leg to the side. Hold your leg out for 30 seconds. Repeat this activity with the opposite leg. Alternate extending each leg to the side.
- ○ Try the Mission Specialist Side Heel-Touches as instructed by your teacher.

Think Safety!

Astronauts know that it is important to safely strengthen their core muscles in order to protect themselves from injury.

- ▭ Breathe normal throughout these physical activities.
- ▭ Concentrate on the core muscles when performing each exercise.
- ▭ Move carefully until you become acquainted with the movement.
- ▭ STOP immediately if you experience any pain or discomfort.
- ▭ Avoid uneven surfaces. To avoid injury, perform these activities on a soft but firm surface.

Mission Explorations:

- ▭ Explore a jungle gym, placing emphasis on climbing, swinging from a bar, or hanging from a ladder following the rungs to the other side.
- ▭ Play a team sport such as kickball or soccer to build core strength.
- ▭ Participate in activities that concentrate on core muscles such as yoga, Pilates, gymnastics, and diving.

Status Check: Have you updated your Mission Journal?