

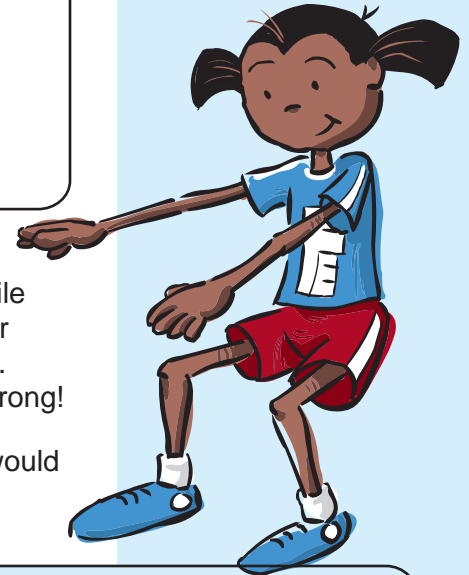
## TRAIN LIKE AN ASTRONAUT MISSION HANDOUT

### YOUR MISSION: Crew Strength Training

You will perform body-weight squats and push-ups to develop upper and lower body strength in muscles and bones. You will also record observations about improvements in *strength training* during this physical experience in the Mission Journal.

Strong muscles and bones are important to your overall health. They are necessary so you can perform chores and tasks at home, at school, or while playing. When you lift an object off the floor, push yourself up out of bed, or bend to see under an object, you are using upper and lower body strength. Physical activities such as these will help keep your muscles and bones strong!

MISSION QUESTION: How could you perform a physical activity that would strengthen your muscles and bones in both your upper and lower body?



### MISSION ASSIGNMENT: Strength Training

#### **Body weight squats:**

Using only your body weight, perform a squat (each squat is a *repetition*).

- ⇒ Stand with your feet shoulder width apart, back straight, looking forward, arms at your side.
- ⇒ Lower your body, bending your knees while keeping your back straight (as if sitting). Raise your arms forward for balance as you squat. At the bottom of the motion, your upper legs should be close to parallel with the floor and your knees should not extend past your toes.
- ⇒ Raise your body back to a standing position.
- ⇒ Try to perform 10 to 25 squat *repetitions*, increasing over time as possible.

#### Rest for 60 seconds.

#### **Push-ups:**

Using your arms to lift your body, perform a push-up (each push-up movement is a *repetition*).

- ⇒ Lie down on the floor on your stomach.
- ⇒ Place your hands on the floor, under your shoulders, shoulder width apart.
- ⇒ Using only your arms to lift your body, lift up slightly until your lower body is off the floor and only your toes and hands are touching the floor. (If this is difficult, you may keep your knees on the floor.) This will be your starting position.
- ⇒ Straighten your arms to raise your body. Do not lock your elbows.
- ⇒ Lower your body back to the starting position.
- ⇒ Try to perform 10 to 25 push-up *repetitions*, increasing over time as possible.

#### Rest 60 more seconds.

#### This entire routine of *strength training* should be repeated two more times.

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

Follow these instructions to train like an astronaut.

**Strength Training:**

Physical activities which use resistance to increase muscle and bone strength, and help improve overall health and fitness.

**Crew****(crew members):**

People working together on a common activity or for a common purpose; a term for NASA astronauts who share their mission with each other.

**Repetition:**

A motion (such as a body-weight squat or a push-up) that is repeated and usually counted.

**Resistance:**

An opposing force (through gravity, weight, or equipment).

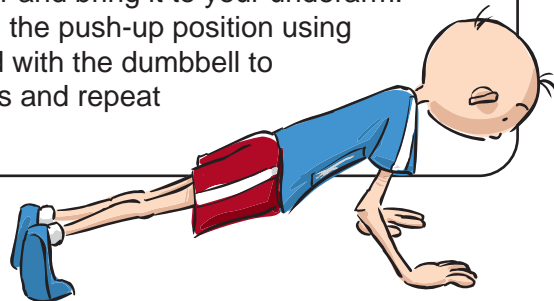
By doing exercises that use your own body weight, you can increase the strength of your muscles and bones. Lack of physical activity can increase the chances of injury because your muscles and bones may be weak. Even easy physical tasks might seem hard!

**It's a NASA Fact:**

Astronauts must perform physical tasks in space that require strong muscles and bones. In a reduced gravity environment muscles and bones can become weak, so astronauts must prepare by *strength training*. They work with NASA strength and conditioning specialists on Earth and continue to work in space to keep their muscles and bones strong for exploration missions and discovery activities.

**Fitness Accelerations**

- Complete five squats, holding the last squat for 30 seconds. Complete five more squats, holding the last squat for 60 seconds. Rest for 60 seconds. Do this three times for a total of 30 squats.
- Complete 10-25 pushups on a balance ball. You will balance your body on the exercise ball and push off with your hands to complete one push-up.
- Grab two 1-3 lb dumbbells. Get into the push-up position and do five push-ups as your hands balance on the dumbbells. Now, lift the dumbbell with your right arm off the floor and bring it to your underarm. You will be balancing your body in the push-up position using one arm as you lift your right hand with the dumbbell to your underarm. Do these ten times and repeat with the opposite arm.

**Think Safety!**

- **Astronauts carefully practice proper *strength training* on Earth so they can safely *strength train* in space.**
- ▢ It is important to do these activities slowly and correctly to avoid injury.
- ▢ Remember that drinking plenty of water is important before, during, and after physical activities.

**Mission Explorations:**

- ▢ Climb across the monkey bars of the play equipment using only your hands.
- ▢ Do walking lunges across the gym floor.
- ▢ Walk up and down a set of stairs.
- ▢ Compete in a game of rope tug-of-war. (Wear gloves to avoid rope burns.)

**Status Check: Have you updated your Mission Journal?**