Stress This*

Purpose

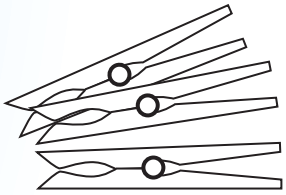
To confirm that muscle strength and endurance increase over time with good stress

Materials

spring-hinge clothespin
Stress This Table (p. 25)
pencil
timer (stopwatch or clock with second hand)
science journal

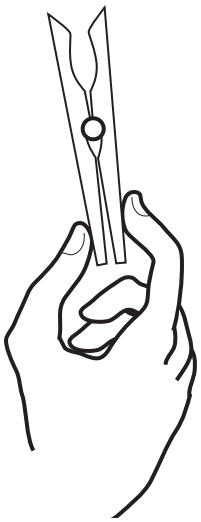
Background

When you think of stress, you usually think of something bad that is happening. Too much bad stress can harm your health, but not all stress is bad. Actually, stress is an important part of a healthy life. Walking, carrying heavy items, and climbing are all physical stresses. Reading, playing a board game, and doing your homework are all mental stresses. Our bodies require some physical and mental stress to be healthy and to grow. Physical stress happens when bones and muscles work against a force. Stress from physical activity is necessary for healthy, strong muscles. Physical stress is extremely important during the growing years, from birth until about age 25. Even after you stop growing, bones need physical stress to maintain thickness and strength. Muscles rebuild and grow as a result of physical stress. Stress can change muscle strength or muscle endurance (the ability to perform an activity for a long time without becoming tired). Muscle endurance is built through repetition. The more frequently muscles perform the same task, the better they become at completing the task and the longer they can perform the task before becoming tired or weak. High-intensity, short duration exercises (or stresses), such as weight lifting, cause muscles to increase in strength. Low-intensity, long-duration activities, such as running and swimming, cause muscles to increase in stamina.



Being fit and healthy means performing physical activities that will improve endurance, flexibility, and strength. When beginning a physical activity, it is important to do the right amount. Doing too much too soon might cause injury. Physical activities should be challenging, but not painful or exhausting.

Procedure



1. Write the date in the first row in the Stress This Table.
2. Predict the number of times you will be able to click the clothespin between your thumb and index finger in your dominant hand for a 1-minute period. (Your dominant hand is usually the hand you use to write.)
3. Record your prediction for trial 1 in the table.
4. Hold the clothespin in your dominant hand between your thumb and index finger.
5. Have your partner time 1 minute for you as you count the number of times you are able to click the clothespin.
6. Record the result for trial 1 in the table.
7. Rest for 1 minute.
8. Make a new prediction for the number of times you will be able to click the clothespin between your thumb and index finger in your dominant hand for a 1-minute period.
9. Record your prediction for trial 2 in the table.
10. Repeat step 5–7 for trial 2.
11. Repeat step 8–9 for trial 3.
12. Repeat step 5–7 for trial 3.
13. Switch roles with your partner and repeat steps 1–12.
14. Predict what would happen if you used your nondominant hand. Record you prediction in your science journal.
15. Repeat the experiment with your nondominant hand.
16. In your science journal, describe what happened over the course of the 3 trials.
17. Repeat steps 1–19 every other day for 2 weeks (7 more times). Record your data in the Stress This Table.

Stress This*

18. In your science journal, describe what happened over the course of the entire experiment.
19. Graph your results over the 2-week period.
20. Compare the results of the boys and girls in your class. Discuss any similarities and/or differences.

Discussion

1. Compare the number of clicks on the first day to the number of clicks after 2 weeks. Describe any pattern.
2. How did your results compare with your predictions?
3. What does this activity tell you about physical stress and the body?
4. Was there a difference between the boys and girls? Why or why not?

Extension

Based on what you learned from this activity about muscle strength and endurance, do the following activities:

1. Time yourself as you write your full name 10 times. Time yourself again as you write your full name 10 times backwards. Record the time it took you for both trials in your science journal. Why do you think there was a difference in the two times? Practice writing your name backwards several times over the next few days. What happens to the time needed to write your name? Explain any differences between times.
2. In a large, open space, stand with your feet flat on the ground. Long jump as far as you can. Measure the distance you jumped and record it in your science journal. Repeat this activity 3–5 times. What happens to the distance you are able to jump? Practice this jump every other day for a week. Now record the distance you are able to jump. Explain any differences in jumps.
3. Time yourself as you stand on one foot. Stop the timer when you can no longer hold your leg up. Record the time in your science journal. Repeat this activity several times. What happens to the length of time you are able to stand on one foot? Why?

Stress This Table

Date	Trial 1				Trial 2				Trail 3			
	Prediction		Actual		Prediction		Actual		Prediction		Actual	
	Dom	Non	Dom	Non	Dom	Non	Dom	Non	Dom	Non	Dom	Non

(In the table, Non stands for nondominant and Dom refers to dominant.)