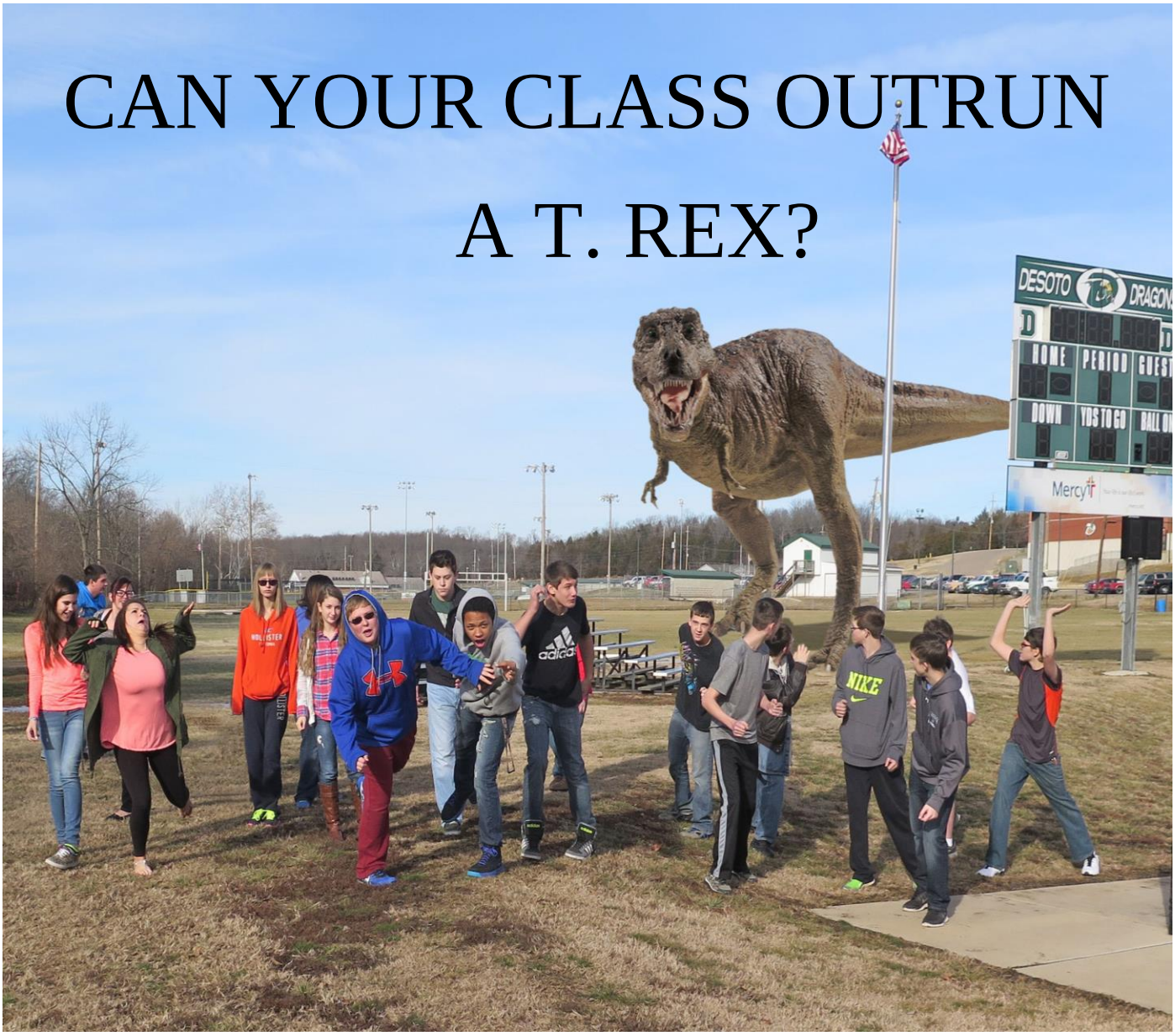
CAN YOUR CLASS OUTRUN A T. REX?



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Out Running A T-Rex

Objective: Students will calculate the velocity and acceleration of a T-Rex and compare it to their own information to determine how many steps they will have to take to out run Sue the T-Rex.

Students will also calculate how much force a T-Rex puts out with each step and compare it to their own force.

Note: This activity would be best to do outside on a baseball field in the soft dirt where footprints of students would be easily visible. If you have to do this inside you will need a large role of paper for students to be able to run across and create footprints. You will also need washable nontoxic paint.

Purpose:

To determine the speed and force of a T-Rex and to compare your speed and force with that of the T-Rex.

Hypothesis: (create a hypothesis that goes with each Objective.)

_____

_____

Materials:

T-Rex feet print templates	Calculator	Newspaper
Stop watches	Lab Sheet	Plastic Tubs
Meter Stick	Graph Paper	Water
Washable non-toxic paint	Roll of art paper	

Research:

The largest and most complete T-Rex skeleton ever found was nicknamed “Sue”, after its discoverer, paleontologist Sue Hendrickson. Measurements of Sue suggest T-Rex was one of the largest carnivorous dinosaurs to ever live, coming in at up to 13 feet (4meters) tall at the hips and 40 feet (12.3 m) long, and is said to weigh as much as 8 tons (16,000 pounds)(about 8,160 kg).

Sue’s step would cover 15 feet so her stride would be 30 feet. And then we will assume she could take 2 steps per second. Using these dimensions we will be able to calculate Sue’s speed, acceleration and force.

Procedure:

1. Divide the class into groups of 5 or 6 each.
2. Create a track way by laying out the T-Rex prints to the proper stride length given in the research. Use 3 stride lengths.
3. Measure the length of the entire track way. Record your measurements on the lab sheet.
4. If doing this inside you will need to lay down a sheet of roll paper alongside of the track way.
5. If you are outside on the baseball field the dirt will show the prints on the runner or the sand pits that are used in track work well for this activity.
6. Have one student counting steps, one timing, and one running the entire track way.
7. (If inside) Have one student remove their shoes and socks and dip their feet in the paint.
8. The student will then run across the paper leaving behind their track way, while another student times the runner.
9. (Weather on a baseball field or on the paper), measure the distance between each step and measure the stride length.
10. Record the time and measurements on the lab sheet.
11. Have each group repeat the process until all members have recorded their data.
12. Once all the data is recorded return to the classroom to finish the lab.

Formulas:

Velocity = Distance ÷ Time

Acceleration = Velocity Final – Velocity Initial ÷ Time

Force = Mass x Acceleration

Analysis:

Lab Sheet

Sue's Mass 8 tons or 16,000 pounds

Sue's Step Length 15 feet

Sue's Stride Length 30 feet

Sue's Time per Stride, 2 seconds per step = How many seconds total _____

Sue's Track Way Length _____

Calculate Sue's Velocity, Acceleration and Force using the above formulas. Show formulas and all work and calculations.

Velocity	Acceleration	Force

Student's Mass _____

Student's Step Length _____

Student's Stride Length _____

Student's Time _____

Student's Track Way _____

Calculate your Velocity, Acceleration, and Force in the table below and show all your work.

Velocity	Acceleration	Force

Conclusion:

1. How did your results compare to your hypothesis?

2. How many steps did you have to take to equal the same distance covered by T-Rex?

3. Would you be able to outrun T-Rex? Explain.

Extension: Caloric Intake of the T-Rex

If a T-Rex lived today and it was loose in DeSoto. How often would it have to feed? How many calories would a T-Rex need?In research they estimate a T-Rex needing about 40,000 Calories a day. A human is said to be about 2,000 calories per Kilogram of weight. Determine how many calories you would be and based on the number of people in the class. How many times would the T-Rex have to feed? (1 Kilogram is = to 2.2 pounds. Use this to determine your weight in Kilograms.)

T. rex Footprint