

What is Jump School?

Jump School is the Rockin' Jump Field Trip Program that offers both a Science and Marketing curriculum. Designed for late elementary to middle school students, Jump School allows participants to use their background knowledge Marketing and of the Properties and Principles of Force and Motion to devise testable questions, collect and record data, analyze graphs, and draw conclusions. Students will be engaged in real-world examples of Marketing, Force, Motion, and Newton's Three Laws. By combining trampolines and learning, students will have a learning experience they will never forget!

There are three parts to the Jump School field trip:

- Part 1: Classroom Pre-Work (45 minutes)
- Part 2: Jump School Science Activity at Rockin' Jump (90 minutes)
- Part 3: Jump Time (60 minutes)

Review the chart below for details of each part:

Part 1: Classroom Pre-Work	Student prepare for the Jump School Science track by reviewing Newton's Three Laws of Motion prior to visiting Rockin' Jump. Teachers are provided with a handout reviewing Newton's Laws of Motion.
Part 2: Jump School Activity at Rockin' Jump	Upon arriving at Rockin' Jump, students receive Socks, watch a Safety Video, and are separated into groups for Jump School Science stations. Rockin' Jump Team Members staff each station to help students collect and record data and debrief each activity.
Part 3: Jump Time	After completing and debriefing each Jump School Science station, students receive Open Jump time before leaving the park.



NEWTON'S 3 LAWS OF MOTION

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First Law	<p>An object at rest will remain at rest unless acted on by an unbalanced force. An object in motion continues in motion with the same speed and in the same direction unless acted upon by an unbalanced force.</p> <p>This law is often called "the law of inertia".</p>
Second Law	<p>Acceleration is produced when a force acts on a mass. The greater the mass (of the object being accelerated) the greater the amount of force needed (to accelerate the object).</p> <p>$F = ma$</p>
Third Law	<p>For every action there is an equal and opposite re-action.</p>



Jump School Stations:

Rockin' Jump offers a total of five Jump School Science Stations for students to experience as part of the program. Each station is led by a Rockin' Jump Team Member and can accommodate up to 20-25 students at a time. When planning a Field Trip, teachers **select 3** of these stations for their students to experience and are asked to have a teacher/student aid at each station to assist with monitoring students.

JUMP SCHOOL : 30 MINS EACH	
STATION 1 TYPE OF JUMP & HANG TIME	Students choose three different types of jump methods and collect data relevant to how much hang time there is for each jump. They identify independent/dependent variables, form a hypothesis, and graph data.
STATION 2 BOUNCE METHOD	Students identify bounce methods that allows a person to start jumping from both seated and standing positions <u>without</u> moving their legs and only moving from their waist up. They collect and analyze data to argue which method is most effective.
STATION 3 SPEED	Students measure distance across various intervals along the trampoline court then time themselves across these intervals. They graph results and analyze the data to determine average speed, increase or decrease in speed, etc.
STATION 4 LEG LENGTH & JUMP HEIGHT	Students identify independent/dependent variables and hypotheses. They measure the length of their leg, then measure maximum jump height using a background measuring board. Students record and graph these measurements and form a conclusion about the relationship between leg length and jump height.
STATION 5 THROWING POSITION & BALL SPEED	Students test the speed at which they throw dodgeballs from two different positions: standing and jumping. They collect and graph the data to conclude results.



STATION 1: TYPE OF JUMP & HANG TIME

CLASSROOM PRE-WORK:

1. What is the Independent Variable? _____

2. What is the Dependent Variable? _____

3. What is the Problem/Testable Variable? _____

4. What is the Hypothesis? _____

PROCEDURE:

1. Choose three different types of jumps and write them in the Data Table on the next page. Examples of types of jumps include pencil, knee-tuck, toe-touch, frog, saddle, etc.
2. Work with the students in your group to perform each jump one at a time. Use a timer to record three trials of each jump.
Tip: Have your partner begin by standing on the trampoline and jumping as high as they can. Start the timer after their feet leave the trampoline on their 3rd jump, and stop the timer when their feet touch the trampoline. Record this time (in seconds) on your Data Table.
3. Record times for all three jumps in the Data Table. Record three trials of each jump and determine the average time for each jump.
4. Record your findings on the Bar Graph on the next page.

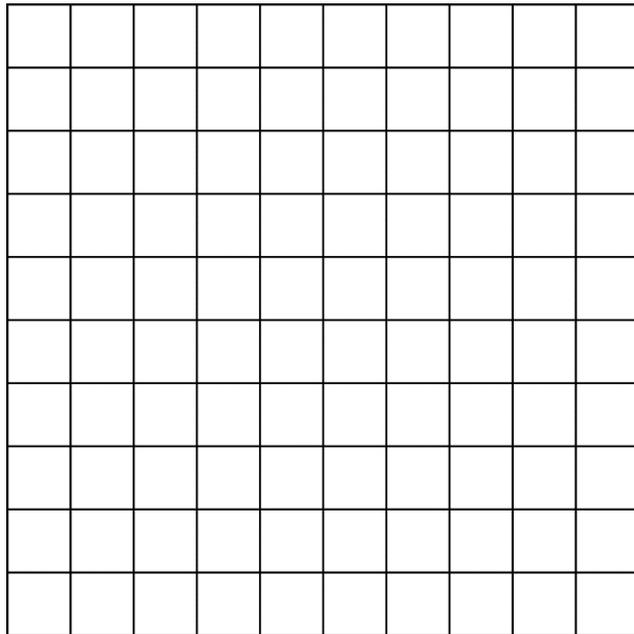


DATA TABLE

TYPE OF JUMP	HANG TIME (SECONDS)			
	<i>Trial 1</i>	<i>Trial 2</i>	<i>Trial 3</i>	<i>Average</i>
Example: Knee-Tuck	3.1	3.3	3.1	3.17
1.				
2.				
3.				

BAR GRAPH:

Graph your findings from the Data Table above.



ANALYSIS/CONCLUSION:

In this investigation, it was found... _____

This occurred because... _____

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STATION 1: TYPE OF JUMP & HANG TIME | ANSWER KEY

STATION PRE-WORK:

1. What is the Independent Variable? *Type of Jump*
2. What is the Dependent Variable? *Hang Time*
3. What is the Problem/Testable Variable? *How does the type of jump used on a trampoline affect hang time in the air?*
4. What is the Hypothesis? *If a knee-tuck jump is used, hang time will increase.*

DEBRIEFING:

- **Data Table:** Check for accuracy.
- **Bar Graph:** Check to ensure the Type of Jump is on the x-axis and Hang Time is on the y-axis.
- **Analysis/Conclusion:** Discuss how students arrived at their conclusions.

FACILITATOR NOTES:

- Supplies needed at this station: timers, signage
- This test may have errors because it will be difficult to keep the amount of force equal. You may want to have a discussion of the importance of a fair test, controls, and only manipulating one variable.



STATION 2: BOUNCE METHOD

CLASSROOM PRE-WORK:

1. What is the Independent Variable? _____
2. What is the Dependent Variable? _____
3. What is the Problem/Testable Variable? _____

4. What is the Hypothesis? _____

CHALLENGE:

Your challenge is to determine a bouncing method that allows a person to start jumping from a seated position and move to a standing jumping position **without** using their legs **and** only moving from the waist up. As a reminder, all Rockin'Jump safety rules must be followed.

PROCEDURE:

1. Work with the students in your group to brainstorm three methods to test. List the three methods you decide to test in the Data Table on the next page.
2. Have three students in your group test each method and rate the difficulty of each using the rating scale.
3. Analyze your data and write an argument to support the best method to use.



DATA TABLE			
METHOD	RATING		
	<i>Jumper 1</i>	<i>Jumper 2</i>	<i>Jumper 3</i>
<i>Example: arm circles</i>	3	4	3
1.			
2.			
3.			
RATING SCALE 1 = EASY 2 = AVERAGE 3 = HARD 4 = IMPOSSIBLE			

ANALYSIS/CONCLUSION:

The best method to use to complete the challenge is... _____

This is the best method to use because... _____



STATION 2: BOUNCE METHOD | ANSWER KEY

CLASSROOM PRE-WORK:

1. What is the Independent Variable? *Bouncing Method*
2. What is the Dependent Variable? *Difficulty Level*
3. What is the Problem/Testable Variable? *How does the bouncing method affect the difficulty level?*
4. What is the Hypothesis? *If a bouncing method is used, then the difficulty level will be (increase or decrease).*

DEBRIEFING:

- **Data Table:** Check for completion.
- **Analysis/Conclusion:** Discuss how students arrived at their conclusions.

FACILITATOR NOTES:

- This station typically moves quickly, so feel free to give students a break at the end if you have spare time.



STATION 3: SPEED

PROCEDURE:

1. Measure the total distance across 1 trampoline square and record the distance. Repeat for the total distance across 2, 3, 4, and 5 trampoline squares. Start at the edge of the pad of one trampoline and measure all the way to the edge of the fifth trampoline square. *Note: 1ft = 30.48cm*
2. Work in your groups to time each student as they walk across the trampoline squares.
3. When walking, start on the pad at the edge of the trampoline square. Walk across 1 trampoline square and record your data. Then repeat for 2, 3, 4, and 5 total trampoline squares. Each student will complete the speed trial five times.
4. Have each student record their own data. Take turns so each student gets timed.

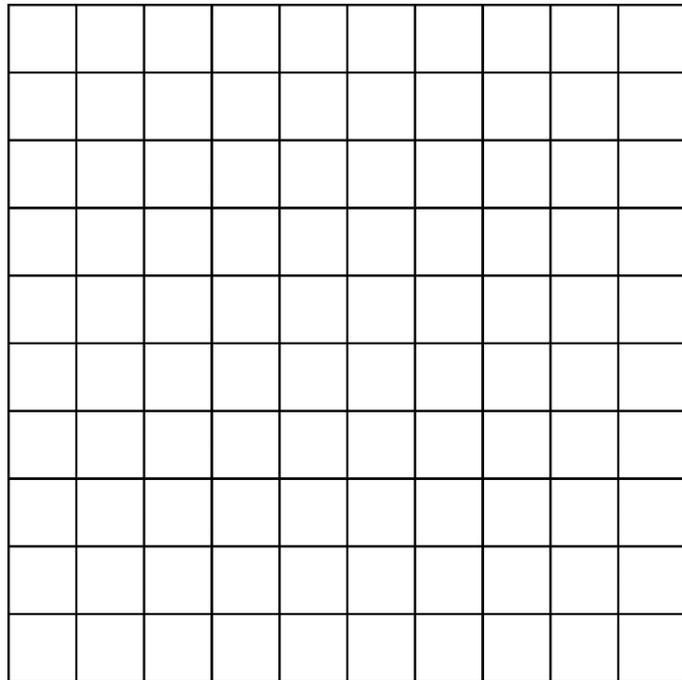
DATA TABLE:

Trampoline Squares	Distance (cm)	Time (seconds)
1		
1+2		
1+2+3		
1+2+3+4		
1+2+3+4+5		



GRAPH:

Graph the data above.
Remember, times and
distances should increase.
Lap 5 should be the total
from beginning to end.



STATION 3: SPEED | ANSWER KEY

PROCEDURE:

- **Data Table:** Check for accuracy. Times and distances should increase. Lap 5 should be the total from beginning to end. →
Line Graph: This will be a line graph of the speed.

Trampoline Squares	Distance (cm)	Time (seconds)
1	243.84 cm	2.11
1 + 2	487.68 cm	4.45
1 + 2 + 3	731.52 cm	7.11
1 + 2 + 3 + 4	975.36 cm	9.89
1 + 2 + 3 + 4 + 5	1,219.20 cm	12.65

FACILITATOR NOTES:

- Supplies needed at this station: signage, measuring tool, and timer



STATION 4: LEG LENGTH AND JUMP HEIGHT

CLASSROOM PRE-WORK:

1. What is the Independent Variable? _____

2. What is the Dependent Variable? _____

3. What is the Problem/Testable Variable? _____

4. What is the Hypothesis? _____

PROCEDURE:

1. Measure the leg length of each student in your group. Measure from the outside of the thigh, from the hip to the floor.
2. Have each student take turns wearing the Jumping Vest and doing a straight up and down pencil jump until he/she reaches maximum height. Use the wall measuring board and the X on the vest to determine the jump height.
3. Record the data for each student in the Data Table on the next page.

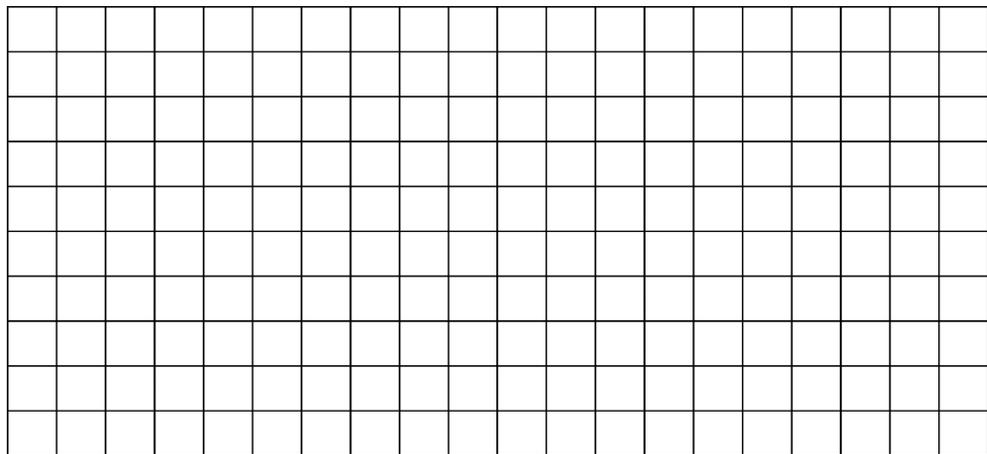


DATA TABLE:

	Maximum Height of Jump (meters)			
Leg Length (cm)	Jump 1	Jump 2	Jump 3	Average
#1				
#2				
#3				
#4				

BAR GRAPH:

Graph your findings of Leg Length and Jump Height from the Data Table above.



ANALYSIS/CONCLUSION:

In this investigation, it was found... _____

This occurred because... _____



STATION 4: LEG LENGTH AND JUMP HEIGHT | ANSWER KEY

CLASSROOM PRE-WORK:

1. What is the Independent Variable? *leg length*
2. What is the Dependent Variable? *jump height*
3. What is the Problem/Testable Variable? *How does leg length affect jump height?*
4. What is the Hypothesis? *If the leg length increases/decreases, then the jump height will be lower/higher*

DEBRIEFING:

- **Data Table:** Check for completion and correctly calculated averages. → **Bar Graph:** Ensure leg length is across the bottom (x-axis) and jump height is up the side (y-axis).
- **Analysis/Conclusion:** Discuss how students arrived at their conclusions. They should use the graph to see how leg length affects jump height and use knowledge of force/motion to explain results.

FACILITATOR NOTES:

- Supplies needed at this station: measuring tape, vinyl banner, jumping vest, signage



STATION 5: THROWING POSITION AND BALL SPEED

CLASSROOM PRE-WORK:

1. What is the Independent Variable? _____
2. What is the Dependent Variable? _____
3. What is the Problem/Testable Variable? _____

4. What is the Hypothesis? _____

PROCEDURE:

1. Choose one person in your group to use the radar gun to measure the speed of each dodgeball throw.
2. One at a time, have each student throw a dodgeball:
 - a) While standing – stand on the trampoline and throw the dodgeball across the court
 - b) While jumping – get your momentum up by jumping, then throw the dodgeball across the court
3. Record the data for each student in the Data Table on the next page.
4. Make sure to take turns so the person using the radar gun gets a chance to throw.

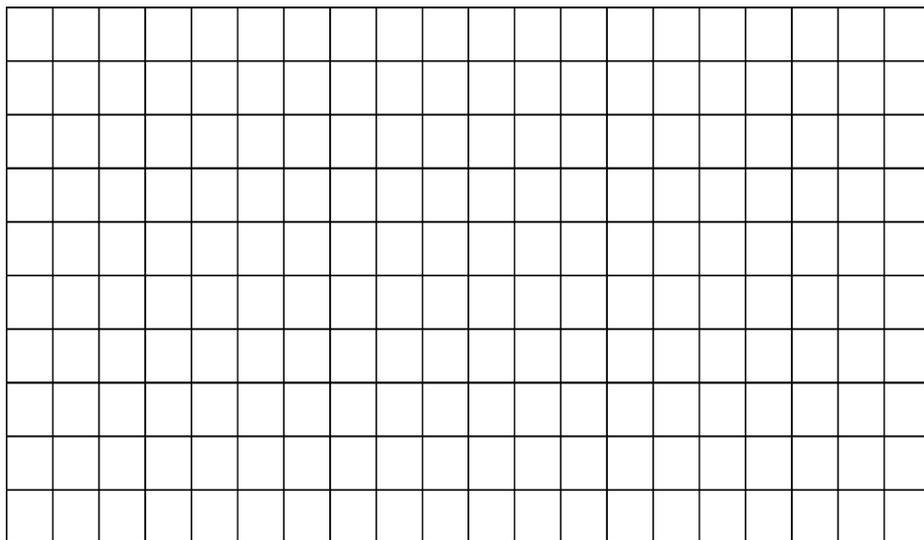


DATA TABLE:

	Speed (while standing)	Speed (while jumping)
#1		
#2		
#3		
#4		
Average		

GRAPH:

Graph your findings from the Data Table above.



ANALYSIS/CONCLUSION:

In this investigation, it was found... _____

This occurred because... _____



STATION 5: THROWING POSITION AND BALL SPEED | ANSWER KEY

STATION PRE-WORK:

1. What is the Independent Variable? *Throwing Position*
2. What is the Dependent Variable? *Ball Speed*
3. What is the Problem/Testable Variable? *How does throwing position affect ball speed?*
4. What is the Hypothesis? *If the throwing position is standing, then the ball speed will increase.*

DEBRIEFING:

- **Data Table:** Check for completion and correctly calculated averages.
- **Graph:** Ensure leg length is across the bottom (x-axis) and jump height is up the side (y-axis).
- **Analysis/Conclusion:** Discuss how students arrived at their conclusions. They should use the graph to determine how throwing position affects ball speed.

FACILITATOR NOTES:

- Supplies needed at this station: radar gun, dodgeballs

