FLINN SCIENTIFIC

Name_____

Activity A. Modeling Faults

Data Table A

Type of Fault	Sketch	Description of Forces and Observations
Normal		
Reverse		
Strike-slip		

Post-Lab Questions

1. What is the relationship between faults and earthquakes?

2. What happened to the river as the land sections shifted along the strike-slip fault? How would this affect the course of the river?

3. What determines whether a strike-slip fault is right-lateral or left-lateral? What type of strike-slip fault was formed in step 14?

Activity B. Elastic Rebound

Data Table B

Block Slippage	Pencil Position (cm)	Leading Edge of Block (cm)	Distance Block Slipped (cm)	Distance Rubber Band Chain Stretched (cm)
Start			N/A	N/A
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Post-Lab Questions and Analysis *(Answer on a separate sheet of paper.)*

1. Determine how far the block moved for each slippage event and fill in the third column of the data table for *Distance Block Slipped*. For example, if the starting position for the block was 10 cm, and when the block slipped the first time it came to rest at 15 cm, the block slipped 5 cm. This is recorded in the second row of the third column for block slippage #1.
2. Determine how far the rubber band chain was stretched for each slippage event and fill in the last column of the data table. For example, if the pencil point started at 35 cm and had been moved to 45 cm when the block slipped for the first time, the rubber band chain stretched 10 cm. This is recorded in the second row of the last column for block slippage #1.
3. What caused the block to slip? Describe the forces involved and the transfer of energy that took place from one slippage event to the next.
4. For each block slippage event, compare the distance the rubber band chain stretched to the corresponding distance the block slipped. Describe any relationship between the two distances. *Optional:* Create a graph that shows the stretch of the rubber bands compared to the distance the block slipped.
5. How is this model similar to the elastic rebound cycle of faults created by the Earth's tectonic plate movement? How is it different?
6. How does this activity explain the unpredictability of earthquake occurrence and magnitude? How are seismologists able to forecast the probability that an earthquake is likely to occur and how great it might be?

Activity C. Seismic Waves

Data Table C

	Wave Motion	Movement of String	Comparing Lesser vs. Greater Compression
Compression Wave			
	Wave Motion	**Movement of String**	**Comparing Lesser vs. Greater Displacement**
Transverse Wave			

Post-Lab Questions

1. How does the string show that the coils of the spring do not move from one end of the string to the other but that energy is being transferred along the spring?

2. How does a greater displacement of the spring relate to the magnitude of an earthquake?

Activity D. Resonance

Data Table D

Frequency	Observations
Low	
Medium	
High	

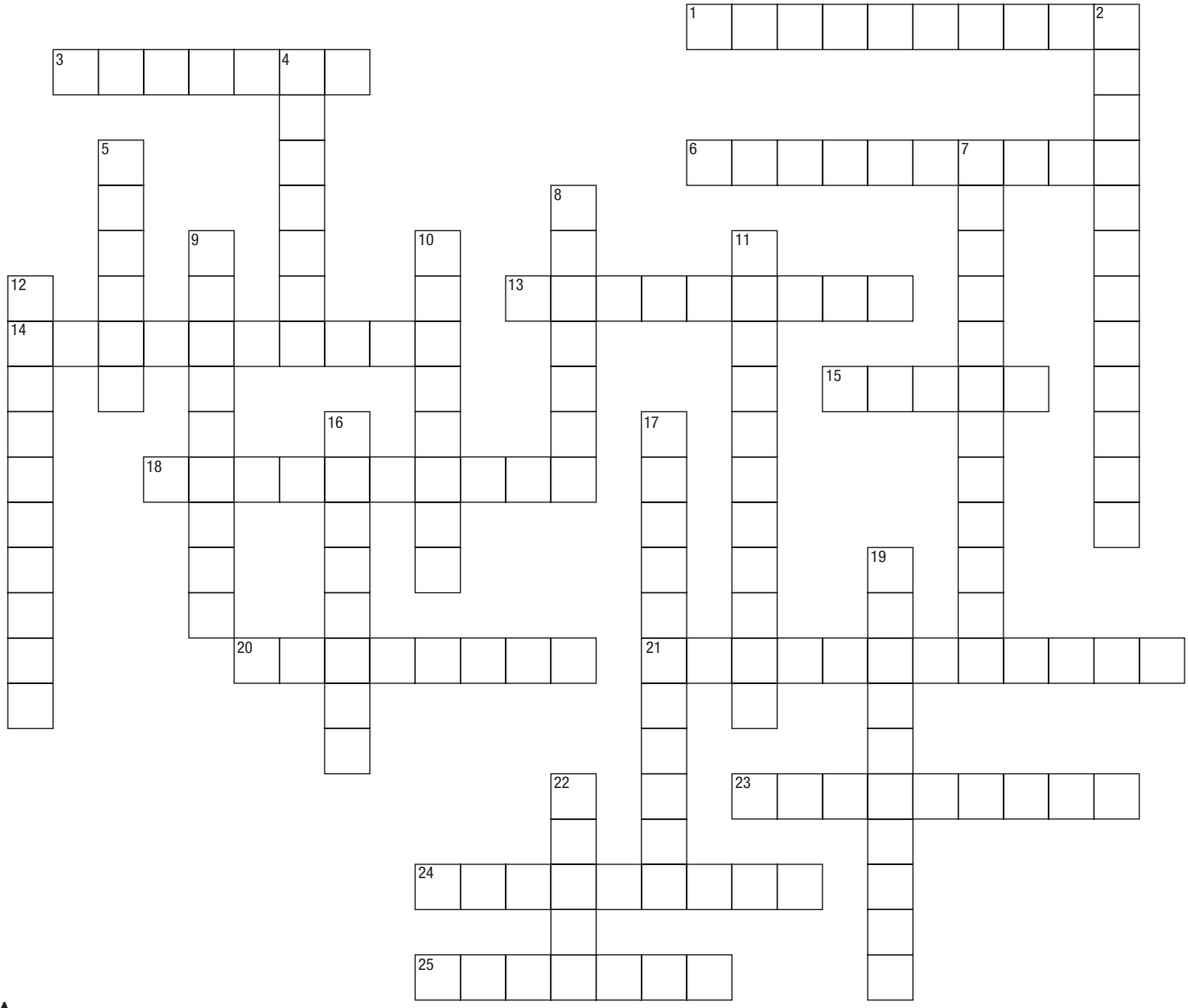
Post-Lab Questions

1. Summarize the observed relationship between the resonance frequency and the length of the wire.

2. Based on your observations, do any of the wires share the same natural frequency? Give reasons for your answer.

3. Based on your observations, explain why a high percentage of the 6- to 12-story buildings described in the Activity D *Background* section suffered considerable damage during the 1985 Mexico earthquake, while shorter and taller buildings did not.

Exploring Earthquakes



Across

1 Motions created within the Earth that release energy when rocks along a fault exceed their elastic limit.

3 The type of seismic wave that reaches a seismograph station first.

6 Famous strike-slip fault in California. (2 words)

13 The rate of vibrations.

14 When a crowd at a stadium does "the wave," they are modeling this type.

15 A fracture within the Earth where rock movement occurs.

18 The phenomenon studied by seismologists.

20 Force that resists movement along a fault.

21 How much stress an object can withstand and still return to its original shape. (2 words)

23 A transverse seismic wave.

24 Determined by triangulation from the arrival of seismic waves for at least three seismograph stations.

25 Force that creates a normal fault.

Down

2 Vibrations that spread out from the focus of an earthquake. (2 words)

4 A fault where one portion of rock is pressed upwards relative to the adjacent rock.

5 A fault caused by pulling forces.

7 A type of strike-slip fault that causes objects to move to the right of their original position. (2 words)

8 The most destructive of the seismic waves; they spread out from the epicenter.

9 Two or more objects vibrating together at the same natural frequency.

10 Builds up as a result of friction along a fault.

11 Looking across a fault line, you see an old river bed that has moved to the left of its original position. (2 words)

12 Type of fault formed when plates slide past each other with little vertical movement.

16 Strike-slip faults experience this type of force.

17 A pushing force.

19 The study of earthquakes and the vibrations they produce.

22 The origin of an earthquake within the Earth.