How Joints Move Lab: Low-write

Name _____

Date _____

Period _____

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Do Now Swing your whole arm in a big circle from the shoulder. 2 minutes, before you open the lab
Now keep your upper arm still and try to swing your forearm in a circle from the elbow.

A. Why do you think your shoulder and your elbow move so differently?

B. Inside a joint, do the two bones rub right on each other? ☐ Yes ☐ No ☐ Not sure yet

☐ I can name the parts of a synovial joint and say what each part does.

☐ I can classify joints by the tissue that holds the bones together.

☐ I can sort the six kinds of synovial joints by how they move.

Part 1. Inside a joint (Tab 1)

SEP 2 Developing and Using Models · CCC Structure and Function

Pull the bones apart. Click every part. Then push all four blocks.

1. Match each part to its job. Write the letter.

A seals the joint like a sleeve · B makes the fluid · C ties bone to bone · D smooth cap on the bone end · E slippery fluid in the space · F hard bone that never touches the other bone

Bone	Articular cartilage	Synovial fluid	Synovial membrane	Joint capsule	Ligament

2. Every block got the same push. How far did each one slide?

A joint	Ice on ice	Wood on wood	Rubber on concrete
m	m	m	m

3. The joint slid how many times farther than ice? Example, not yours: 6 ÷ 2 = 3 times.

☐ 2 times ☐ 4 times ☐ 40 times

READ FIRST. In the lab, find the green Learn It box and read it. Then answer 4 to 6.

4. What holds each joint together? Clue: barely moves = fibrous. Moves a little = cartilaginous. Moves freely = synovial.

Seams between skull bones	☐ Fibrous ☐ Cartilaginous ☐ Synovial
Knee	☐ Fibrous ☐ Cartilaginous ☐ Synovial
Disc between two vertebrae	☐ Fibrous ☐ Cartilaginous ☐ Synovial
A tooth in its socket	☐ Fibrous ☐ Cartilaginous ☐ Synovial
Shoulder	☐ Fibrous ☐ Cartilaginous ☐ Synovial
Where the hip bones meet in front	☐ Fibrous ☐ Cartilaginous ☐ Synovial

5. A knee X-ray shows a dark gap between the femur and the tibia. What fills it? Use the word bank. Two words are not used.

Word bank: cartilage · synovial fluid · air · muscle

The gap is filled with _____ and _____.

6. A friend says, "In your knee, the bones rub right on each other." Finish the sentence. The bones do not rub because each end has a cap of _____, and _____ fills the space between them.

Part 2. Test six joints (Tab 2)

SEP 4 Analyzing and Interpreting Data · CCC Patterns

Pick each joint. Press all four tests. Fill in the table as you go.

7. Fill in the table.

Write the degrees it moves, or "no." For Slide, write yes or no.

Joint	Bend	Side to side	Twist	Slide
1. Shoulder				
2. Knuckle				
3. Base of the thumb				
4. Elbow				
5. Top of the forearm				
6. Between wrist bones				

8. Which joint moved the most ways? ☐ Shoulder ☐ Elbow ☐ Between wrist bones

READ FIRST. In the lab, find the green Learn It box and read it. Then answer 9 to 11.

9. Name the kind of joint for each one in your table. Use the list.

Kinds: ball-and-socket · condylar · saddle · hinge · pivot · plane

1	2	3	4	5	6

10. Each joint was tested the same way. Name the kind. Clue: bends only = hinge. Twists only = pivot.

Hip: bends, side to side, twists	
Middle joint of a finger: bends one way	
Top of the neck: twists only	
Between two ankle bones: only slides	
Wrist: bends and side to side, no twist	

11. Model check (SEP 2). What does a model joint leave out?

☐ muscles and real cartilage ☐ the two bones ☐ the way it bends

Part 3. Muscles make the move (Tab 3)

SEP 6 Constructing Explanations · CCC Cause and Effect

Slide the biceps shorter. Press Record at 34, 32, 30 and 28 cm. Then press Triceps pulls.

12. Copy your records.

Biceps length (cm)	34	32	30	28
Elbow angle (°)				

13. The biceps got 6 cm shorter. Example: 180° to 150° is a change of 30°. Elbow change: 180° – _____ = _____°

☐ small move ☐ big move

READ FIRST. In the lab, find the green Learn It box and read it. Then answer 14 to 15.

14. Name each move. Use the names.

Names: flexion · extension · abduction · adduction · rotation · circumduction · pronation · supination

Raise your arms out to the sides	
Turn your palm up to carry soup	
Shake your head no	
Straighten your knee to kick a ball	
Swing your arm in a big circle	
Bend your elbow to lift a cup	

15. Explain it (SEP 6). Finish the sentence. The shoulder is a _____ joint, so it moves _____ ways. The elbow is a _____ joint, so it moves only _____ way.