



Human Body Systems

Virtual Learning

9-12th PLTW[®] HBS

PLTW[®] 4.1.1 Bones, Joints, Action

April 6, 2020



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9-12th PLTW HBS
Lesson: April 6, 2020

Objective/Learning Target:

Students will be able to determine how a structure of a joint provides information about its function. (*Reference: PLTW[®] 4.1.1 Bones, Joints, Action*)



Human Body Systems

Let's Get Started / Warm Up Activities:

Watch Videos:

- [What are Joints? Types & Functions of Joints](#)
- [Synovial Joints](#)

Lesson/Activity:

Watch Video: [The 6 Types of Synovial Joints*](#)

**Video note: Ellipsoid joints are also known as condyloid joints.*

Activity #1: Using the video above as a reference, complete the following:

- In your notebook or on a piece of paper, draw the six types of synovial joints.
- Using arrows, draw the motion of each of the six synovial joints.
- Draw a pencil sketch of how bones meet up for each of the six synovial joints.

Activity #2: Draw a rough sketch of the human body. Find an example of each of the six types of synovial joints in the body and label on your graphic organizer.

Lesson/Activity continued:

Activity #3: In your notebooks or on a piece of paper, pick an activity or sport (Ex: playing soccer, folding clothes, etc.). Write a paragraph about the movements you would use while performing the activity or playing the sport. Make sure the paragraph makes sense and describes the activity or sport (even make it into a story). Include the following:

- Specific actions taken while performing the activity or playing the sport.
- Body parts/body locations used in performing the activity or playing the sport.
- The synovial joints used (underline these in your paragraph). Make sure to include all six joints: saddle, ball & socket, condyloid, plane, hinge, and pivot.

Activity #1 Answer:

Click [HERE](#) and scroll down to “Types of Synovial Joints” to view the answers.

Activity #2 Answer:

Click [HERE](#) and scroll down to “Types of Synovial Joints” to view the answers.

Activity #3 Answer:

There are many possible answers. Here is a partial example from a paragraph describing a soccer game. Remember that all six (6) joints need to be included and underlined in your paragraph.

Example: I kicked the soccer ball using my ball & socket joint in my hip, and my hinge joints in my knee and my ankle. The ball flew into the goal and we won the match!

Practice:

Practice Activity: In your notebook or on a piece of paper, list which joint(s) would be used during the following activities. Feel free to act it out, and think about the movements you are making at each joint.

1. Swing a baseball bat
2. Throw a football
3. Dribble a basketball
4. Do jumping jacks
5. Kick a soccer ball
6. Do push-ups
7. Do “The Robot” dance
8. Wave goodbye
9. Hop on one leg
10. Jump with a jump rope

Practice Answers:

Note: The following are some of the main body locations and joints for these actions.

1. Swing a baseball bat: Shoulder (ball & socket), elbow (hinge), wrist (condyloid/ellipsoidal), hip (ball & socket), knee (hinge), and ankle (hinge)
2. Throw a football: Shoulder (ball & socket), elbow (hinge), wrist (condyloid/ellipsoidal)
3. Dribble a basketball: Shoulder (ball & socket), elbow (hinge), wrist (condyloid/ellipsoidal)
4. Do jumping jacks: Shoulder (ball & socket), elbow (hinge), wrist (condyloid/ellipsoidal), hip (ball & socket), knee (hinge), and ankle (hinge)
5. Kick a soccer ball: Hip (ball & socket), knee (hinge), and ankle (hinge)
6. Do push-ups: Shoulder (ball & socket), elbow (hinge), wrist (condyloid/ellipsoidal), hip (ball & socket), knee (hinge), and ankle (hinge)
7. Do “The Robot” dance: Shoulder (ball & socket), elbow (hinge), wrist (condyloid/ellipsoidal), hip (ball & socket), knee (hinge), and ankle (hinge)
8. Wave goodbye: Shoulder (ball & socket), elbow (hinge), wrist (condyloid/ellipsoidal)
9. Hop on one leg: Hip (ball & socket), knee (hinge), and ankle (hinge)
10. Jump with a jump rope: Shoulder (ball & socket), elbow (hinge), wrist (condyloid/ellipsoidal), hip (ball & socket), knee (hinge), and ankle (hinge)

Additional Practice and/or Resources:

Go to these websites:

[4.1.1 Bones, Joints, Action Flashcards](#)

Test your knowledge by clicking on the link above.

[Total Hip Replacement: Medical Animation](#)

Watch this animation to observe hip replacement surgery (total hip arthroplasty), which can be used to alleviate the pain and loss of joint mobility associated with osteoarthritis of the hip joint. What is the most common cause of hip disability?

[What is Rheumatoid Arthritis?](#)

Watch this video to learn about the symptoms and treatments for rheumatoid arthritis. Which system of the body malfunctions in rheumatoid arthritis and what does this cause?

Additional Practice and/or Resources continued:

Go to these websites:

[Why do your knuckles pop?](#)

Some people love the feeling of cracking their knuckles, while others cringe at the sound. But what causes that trademark pop? And is it dangerous?

[Five Facts About Synovial Joints](#)

Watch this animation to learn additional facts about synovial joints. Write the five facts in your notebook or on your piece of paper.

[Structure of Synovial Joints](#)

Watch this video to learn the ins and out of the structure of synovial joints. Write down at least 3 facts.