

Joint Jive

Leader Guide



Fashion
through science

WITH THIS ACTIVITY

- Video
- Handout
- Challenge Question



We are
Engineers!



Movement
Improvement



Marvelous
Materials



Smart
Clothing



Patternmaking
Tools n' Tech

MODULE

Big Picture

Movement in the body is a result of our bones, joints and muscles working together as a system of levers surrounding the joints. During motion, our muscles expand and contract in the areas surrounding its joints. Before a designer can create garments that allow wearers to move easily in them, the designer must know what kind of body movements need to be performed in the clothing and what range of motion is needed. Designers want to help the *Joints Jive!*

Materials

What they need: (per pair)

- Tape measure
- Washable marker
- Pencils/sharpener
- Wet wipes
- Laptop and speakers
- Video of dancer and music or recruit a Hip hop dancer/instructor!

Prep Time: 15 Minutes

Activity Time: 1 Hour

Difficulty: Level 1

What's the goal?

Young designers understand that different body movements produce changes in dimension over joints.

Grouping

The dancing activity will be done in one group and the “measuring movement”



portion should be performed in pairs.

Let's Dance

Have the young designers dance and take note of which body parts move and how they move during the dance. You can approach this several ways:

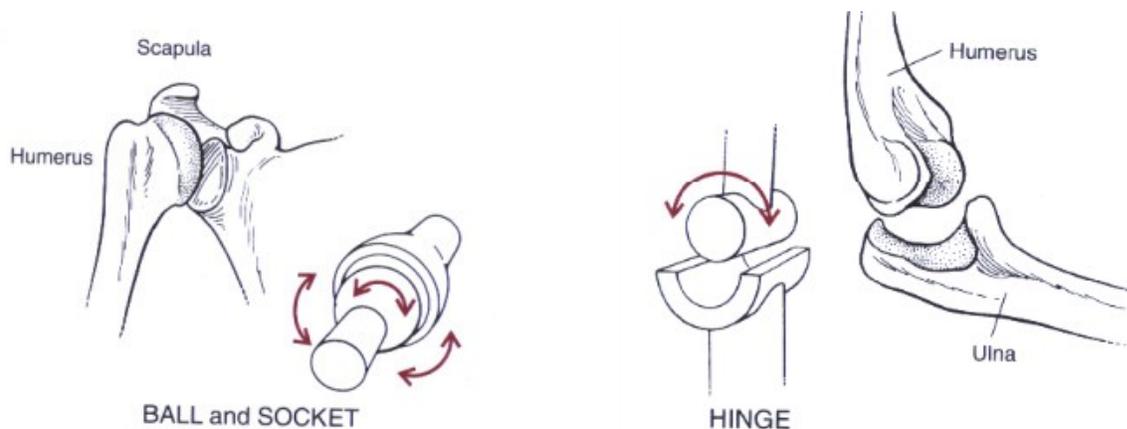
- Ask for a volunteer(s) to dance for the group.
- Show the Dance video and have designers learn the dance if they wish.
- Recruit a dancer to demonstrate, and then teach, a popular dance.

Based on their experience learning or observing the dance:

- Ask which joints are used, in what directions those joints move, and what the range of motion is for each joint.
- Ask if anyone knows the names of any joint types and have them explain.
- Introduce the Ball and Socket and Hinge joints. Have designers test their joints to confirm the type and range of motion for these major joints.

Ball and Socket Joints- made of a bone with a rounded end that sits inside another bone with a cup-shaped opening. This type of joint has the widest range of motion, e.g. shoulders and hips.

Hinge Joints- made of two bones molded to each other in a manner that only allows for movement on one plane. This type of joint allows for bending and unbending motions, e.g. elbows and knees.



Let's get started!

1. Split the group into pairs, or groups of three if necessary. Designate one member to act as designer and the other as subject.
2. Instruct the subjects to bare an arm, and bend the elbow. The designers should mark a dot at the most prominent spot on the elbow (Figure 1).
3. Subject then straightens arm, allowing it to hang straight down.
4. Designer marks a second dot 2" (5cm) above the first dot, and a third dot 2" below the dot at the elbow point (Figure 2).
5. With the subject's arm straight, the designer measures and records the exact length between the bottom and top dots. It should be approximately 4" (10cm).
6. Subject bends elbow and designer measures the distance between the top and bottom dots again, passing **over** the bent elbow point. Record this length.
7. Calculate the difference between these two measurements (handout):
8. Bent elbow length - Straight elbow length = Change in arm length

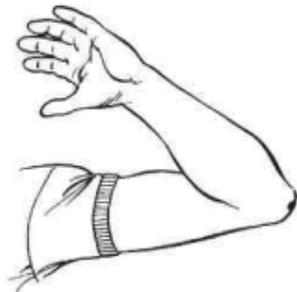


Figure 1

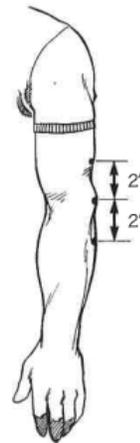


Figure 2

Discussion Points

This activity showed us how our skin can change length and dimension due to body movement. Designers have to keep these changes in mind as they create garments because clothing acts like a “second skin”: it needs to be able to move with us.

Our bodies have seven kinds of joints, but the two most common ones affect the largest joints and are of most concern when designing clothing for body movement. The actual range of motion in our joints varies considerably from person to person depending on age, gender, body build, and health.

ASK:

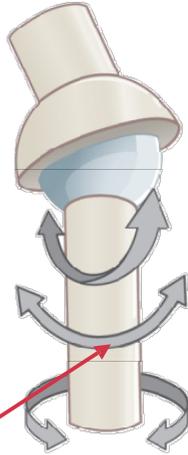
- Based on your observations of hinge joints, how does a garment need to accommodate that movement?
Answer: Length and width need to be allowed for a joint that gets longer and wider as it bends.
- Based on your observations of ball and socket joints, how does a garment need to accommodate that movement?
Answer: Space for rotation of a ball and socket joint.
- If you were to design a dance outfit, what design features would you incorporate to allow movement?
Answer: Stretch, fullness, openings are all possibilities.

Have the young designers complete the Challenge Question individually.

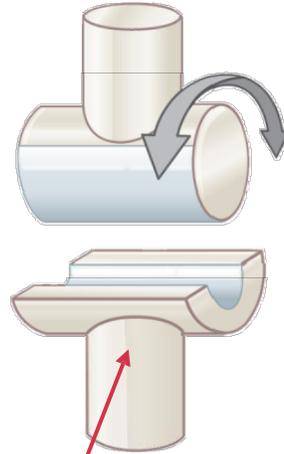
Challenge Question Answer Key

Draw a line to match each joint with the correct body part:

Ball and Socket



Hinge Joint



A

Hips

B

Wrists

C

Fingers

D

Neck

What type of joint has the most range of motion (circle one)?

Ball and Socket Joint

Hinge Joint

When designing a garment, you need to allow more movement for ball and socket joints than hinge joints:

TRUE

FALSE