Skeletomuscular system: we all need something, to pull on...
The Skeletomuscular System:  
We All Need Something, to Pull On!

So, how do your muscles and bones work together? You’ve learned about how muscles are constructed, how they attach to bones, and how joints work. Now, let’s put it all together as we build our muscle scienstructable and see it in action.

Objective: To identify various types of joints and to build a muscle and analyze muscle action

Here’s What You’ll Need to Create this Scienstructable:
- Muscle Scienstructable template
- Joint analogy sheet
- Scissors
- Single hole punch
- Glue stick
- Clear Tape
- Two 12” long pieces of red or pink yarn
- Metal brad

What You Do:
1. Cut out your Scienstructable Hand, Radius and Ulna, and Humerus. Be sure to cut along the solid black lines.
2. Fold each piece on the dotted lines provided.
3. Using the hole punch, punch a hole wherever there is a black dot on the Scienstructable.
4. Using a glue stick, place glue where indicated on the hand bones. Attach the hand to the inside of the radius and ulna piece, so that when folded, the bones are on the outside of the paper. The hand should look like it is attached to the radius and ulna.
5. Attach the end of one piece of yarn to the “X” on the Radius, with the yard leading away from the hand.
6. Attach the end of the other piece of yarn to the “X” on the Ulna, with the yarn leading away from the hand.
7. With the radius and ulna folded, line up the holes at the end with the hole at the end of the humerus bone.
8. Lay the yarn pieces inside the humerus so that they emerge from the other end of the humerus.
9. Take the RADIUS yarn and thread it UP through the bottom BICEP muscle and DOWN through the top BICEP muscle. It should emerge from inside the humerus piece.
10. Take the ULNA yarn and thread it UP through the bottom TRICEP muscle and DOWN through the top TRICEP muscle. It should emerge from inside the humerus piece.
11. Now, fold the humerus so that it is closed and attach the humerus to the radius and ulna with the metal brad through the aligned holes.
12. Holding on to the humerus, pull the bicep yarn to watch the bicep muscle flex and move the arm up. Then, pull the tricep yarn through the top of your humerus to see the tricep muscle flex and pull the arm down!
The Skeletomuscular System: _____________________

We All Need Something, to Pull On!

Cut out the following template and put together using the directions on the previous page. **DO NOT CUT ON THE DOTTED LINES. ONLY CUT ON THE SOLID LINES.**
The Skeletomuscular System: _____________________
We All Need Something, to Pull On!

Now that you’ve created your working muscle, let’s talk about it! Answer the following questions about the skeletomuscular system.

1. Describe the relationship between the skeletal and muscular systems. ________________
   ____________________________________________________________________________
   ____________________________________________________________________________
   ____________________________________________________________________________
   ____________________________________________________________________________

2. Which type of muscle tissue does the yarn represent? ________________

3. Is this voluntary or involuntary muscle? ____________________________

4. What kind of joint is represented in your muscle Scienstructable? ________________________

5. Scavenger Hunt! For each type of joint below, identify as many objects or tools in your classroom that have a similar or same motion.

<table>
<thead>
<tr>
<th>Type of Joint</th>
<th>Objects/Tools in Classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>HINGE</td>
<td></td>
</tr>
<tr>
<td>PIVOT</td>
<td></td>
</tr>
<tr>
<td>SLIDING</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>BALL AND SOCKET</td>
<td></td>
</tr>
</tbody>
</table>
The Skeletomuscular System:  
Name: _____________________

We All Need Something, to Pull On!

Now that you’ve created your working muscle, let’s talk about it! Answer the following questions about the skeletomuscular system.

1. Describe the relationship between the skeletal and muscular systems.  ________________  
__________________________________________________________________________  
__________________________________________________________________________  
__________________________________________________________________________  
__________________________________________________________________________

2. Which type of muscle does the yarn represent?  __________________________________

3. Is this voluntary or involuntary muscle?  _________________________________________

4. What kind of joint is represented in your muscle Scienstructable?  _____________________

5. Identify the type of joint that is represented by each picture below.

   A.  
   B.  
   C.  

   D.  
   E.  

6. For the desk pictured to the right, please identify at least THREE JOINTS.

   ___________________________________  
   ___________________________________  
   ___________________________________  

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The Skeletomuscular System: Teacher Key
We All Need Something, to Pull On!
Now that you’ve created your working muscle, let’s talk about it! Answer the following questions about the skeletomuscular system.

1. Describe the relationship between the skeletal and muscular systems. The muscular system and skeletal system work together to move the body. Muscles attach to bones using tendons. Muscles insert on one bone and attach to an adjacent bone. When one muscle of a pair contracts, the other relaxes, allowing the muscle to pull the bone toward it.

2. Which type of muscle tissue does the yarn represent? **Skeletal**

3. Is this voluntary or involuntary muscle? **Voluntary**

4. What kind of joint is represented in your muscle Scienstructable? **Hinge**

The next two activities have been differentiated for above and below level students.

**ABOVE LEVEL**

5. Scavenger Hunt! For each type of joint below, identify as many objects or tools in your classroom that have a similar or same motion. Possible answers provided below

<table>
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<th>Type of Joint</th>
<th>Objects/Tools in Classroom</th>
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<tbody>
<tr>
<td><strong>HINGE</strong></td>
<td>Clipboard, door or cabinet hinge, desk top hinge, crayon box lid, light switch, book or notebook cover, stapler, three hole punch</td>
</tr>
<tr>
<td><strong>PIVOT</strong></td>
<td>Door knob, water bottle cap, compass, scissors, hands on a clock, faucet handle, office chair seat, office chair casters, LCD or overhead projector mount, single hole punch</td>
</tr>
<tr>
<td><strong>SLIDING</strong></td>
<td>Book on a table top, window sliding open, zipper on a pencil pouch or jacket, chair sliding across the floor, drawer, E-Z Grader slide grader</td>
</tr>
<tr>
<td><strong>FIXED or IMMOVABLE</strong></td>
<td>Any place where two objects are permanently attached together – wall, table, door, window</td>
</tr>
<tr>
<td><strong>BALL &amp; SOCKET</strong></td>
<td>Ball on the bottom of a mouse, roller ball lip gloss or perfume,</td>
</tr>
</tbody>
</table>

**BELOW LEVEL**

5. Identify the type of joint that is represented by each picture below.
   A. **Pivot**      B. **Hinge**      C. **Sliding**      D. **Hinge**      E. **Pivot**

6. For the desk pictured to the right, please identify at least THREE JOINTS.
   The top is a hinge joint, the drawer is a sliding joint and the legs attached to the top is a fixed joint.
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