Grades 6-8

Name: _____ Class: _____

Assessment Questions

Module 1.1: Intricacies of a Volleyball Court

1. Valentina is trying to make a scale drawing of the locker room. She knows the dimensions of the room is 48 feet long by 35 feet wide. If she is using a 2 foot to 0.5 inch for her scale drawing, how long will the drawing be?
   a. 24 inches
   b. 12 inches
   c. 6 inches
   d. 48 inches

1. Which of the following demonstrates equal portions?
   a $\frac{1}{2} = \frac{3}{4}$

   b. $\frac{1}{2} = \frac{1}{4}$

   c. $\frac{2}{2} = \frac{3}{4}$

   d. $\frac{1}{2} = \frac{2}{4}$

2. Danielle is trying to determine if a players' height and wingspan (length of arms) is portional to the height and length of the net. Which of the following is NOT a way to determine if they are portional?
   a. Divide the width by the height of each object and the quotient would be equal.
   b. Find the area of each.
   c. Set up the dimension as a fraction and determine if the fractions are equal.
   d. Divide the height by the width of each object and the quotient would be equal.

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Module 2.1: Communication and Drills

1. True or False: Good science procedures are repeatable and controlled.

2. Short answer: Why are good procedures important in science and in volleyball?

3. Which of the following is the best written procedure for a partner bump, set, spike drill?
   a. Get with a partner and bump, set and spike.
   b. With a partner, partner 1 will toss the ball to partner 2; partner 2 will bump to partner 1; partner 1 will set the ball up for partner 2; partner 2 will then spike the ball. After one rotation, switch partners: partner 1 will perform as partner 2 and partner 2 will perform as partner 1.
   c. One partner will bump and spike the ball and the second partner will set the ball.
   d. Partner A will do the following: toss the ball, set the ball to partner B, and then retrieve the ball. Partner B will do the following: bump the ball to partner A and spike the ball; switch partners each time.

5. Justify your selection for question number three.

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Module 3.1: Volleyball Properties

1. Which of the following is the best evidence to support the claim: Light Touch Volleyballs have the best performance.
   a. I play better with the Light Touch Volleyball and the Recreational Volleyball is difficult to serve.
   b. The Light Touch Volleyball has a 5ft average bump, a density of 52 kg/m^3, and a 8/10 success rate with serves.
   c. When using the Light Touch Volleyball, my team scored 15% more points in a match.
   d. Light Touch Volleyballs have a density of 60 kg/m^3.
   e. The Light Touch Volleyball has a 5ft average bump, a density of 52 kg/m^3, and a 8/10 success rate with serves. Whereas the Recreational Volleyball has a 3ft average in bump, a density of 63 kg/m3, and a 6/10 success rate with serves.

2. A player wants to measure the density of their athletic shoes. What is the best way for him/her to determine the density?
   a. Divide mass by volume
   b. Multiple mass by volume
   c. Determine the number of molecules in the shoes
   d. Look up the materials in the shoes

3. True or False: A volleyball of higher density would have molecules more compacted in the same space.

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Assessment Questions

Module 4.1: Calculating Total Force

1. A player serves and bumps a ball with a mass of 0.225 kg, accelerating at a rate of 9.2 m/s2. What is the force acting on the ball?
   a. F = 0.225 kg/ 9.2 m/s^2
   b. F = 0.225kg * 9.2 m/s^2
   c. F = 9.2 m/s^2 / 0.225kg
   d. F = 12 m * 0.225 kg

2. Which of the following has the greatest force based on the acceleration? (The mass of the ball remains constant at 0.4 kg).
   a. An overhand serve with the acceleration of 8 m/s^2
   b. A bump with an acceleration of 3 m/s^2
   c. A spike with an acceleration of 5 m/s^2
   d. A set with an acceleration of 1 m/s^2

Module 5.1: Improving Serving

1. What is a controlled experiment?
   a. An experiment controlled by a scientist.
   b. An experiment where only one variable is changed.
   c. An experiment where data is collected by technology.

2. Put the following in order of how a volleyball player can test and improve his/her serve:
   a. Collecting Data
   b. Asking a question about how they can improve their serve
   c. Report to a coach
   d. Research
   e. Changing one variable at a time
   f. Making a hypothesis
   g. Analyzing data

   1._____ 2._____ 3._____ 4._____ 5._____ 6._____ 7._____

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Assessment Questions

Module 6.1: Kinetic Energy and Speed

$K=\frac{1}{2} MV^2$

1. Apply the above formula and following information to calculate the kinetic energy of a volleyball serve:
   a. 1.2 J
   b. 12.2 J
   c. 24.3 J
   d. 48.7 J

2. According to the equation above, if the velocity (or speed) of a volleyball is increased, what will also increase?
   a. Mechanical Energy
   b. Force
   c. Kinetic Energy
   d. Mass

3. Tina served the ball and calculates the kinetic energy at 18.7 J. Julia's serve calculated kinetic energy at 20.3 J. Which would be more challenging to return?
   a. Tina's
   b. Julia's

Module 7.1: Successful Serving

1. If Emily has a probability of making a serve of 0.75, how many serves will she make in the season if she attempts 123 serves?
   a. 80
   b. 92
   c. 105
   d. 112

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2. Which of the following is a probability?
   a. 1.33
   b. 8
   c. 2/5
   d. 0.43

3. Kira has a 0.93 probability of making a torque serve and a 0.76 probability of making an overhead serve. Should she attempt a torque or overhead serve?

Module 8.1: Adaptive Technology

1. Which of the following is an essential reason to collect data when testing a design?
   a. To determine the overall success of the design.
   b. To prove your design was the best.
   c. To measure how long it will work.
   d. To compare your initial design and redesign.

2. Put the steps of the Engineering Design for Adaptive Volleyball in order:
   a. Plan and build a prototype: Draw diagrams and build a device or implement a support.
   b. Brainstorming and multiple designs for a solution.
   c. Identify the problem: Some of the players in adaptive volleyball need assistance to retrieve balls that went out-of-play..
   d. Redesign: Make changes to your design based on the data and interviews.
   e. Test the prototype: Ask a local adaptive team to test the device or system, or play adaptive volleyball and test it. Record data and interview participants on its success.
   f. Communicate: Present your idea and results to the class or email your ideas to the adaptive sports league.
   g. Research: Learn more about adaptive sports and who plays? What kind of disabilities do players have? Interview players about their challenges.

1._____ 2._____ 3._____ 4._____ 5._____ 6._____ 7._____