Free throw: The elbow joint is a hinge joint. You start with elbow flexion, which is caused by the biceps being the agonist and the triceps as the antagonist. This movement would happen to help push the ball towards the hoop. You might want to put backspin on the ball so it bites back on the board and comes down. This would be caused by the wrist.

Layup: Shoulder joint = shoulder flexion which is caused by the deltoid being the agonist, and the latissimus dorsi being the antagonist. You want it so your knee and elbow are on a string, at the same time you want to go into shoulder extension which is caused by the latissimus dorsi being the agonist and the deltoids being the antagonist which will cause the shoulder push into the layup.

Free throw: Force summation. You would bend your knees which is caused by the Quads and the hamstrings. Quads being the antagonist and your hamstrings being the agonist. By using force summation, the bigger muscles in this case being the quads and hammys, you would want to push off the legs going to the abdominals – up through your abdominals to your chest, and then you would want to have the elbow flexed, pushing through the elbow all the way up to the ball and put backspin on the ball so it bites back down, so using force summation to travel momentum through the body

Newton’s 3 laws. The first law an object at rest will not move until a force is acted upon it. So in this case, the ball will stay in your hand until you have released the ball at the final stage forcing it to. This is caused by elbow extension

The second law the law of acceleration which means how much force you put on the ball will determine how fast and how hard by what velocity it will travel towards the hoop. You would want to release it at 45 degrees and put backspin on it so it bites back down and goes into the hoop. And also the third law, for every action there is an equal and opposite effect. So in the free throw case, it will be the jump. How hard you push into the ground will determine how high you will jump to cause a greater of angle of release into the hoop.

During the 4 v’s 4 basketball game my original breathing rate changed from 26 bpm (breaths per minute) to 40 bpm. My heart rate also rapidly increased from 92bpm to 162 bpm. Also sweat started to occur in my body which was trying to cool me down. I found it hard to recover from the first games because I was not fit, and struggled to last for 20 minutes. When I went to defend, I was using the lactic acid system. This meant that I was trying to sprint and stay with my partner in short bursts, but I could not maintain this, so defended poorly. If I had to jump up to get the ball, I found that my phosphate system was good at the start of the game, but because I was so unfit I could not keep jumping up to get the ball which is needed to be a good attacker. My lactic acid system will be in play as well because there is a lot of sprinting in basketball. My phosphate system will be in use as well because of all the jumping I will be doing. All of these energy systems will be working more efficiently, so I will be able to last for an entire game of basketball (using the aerobic system).

Long term effects of training: The heart gets bigger and the muscles get bigger. This means that I can pump blood to my muscles faster and my muscles will be larger so I can jump high. I will have more blood being pumped around my body to my bigger working muscles, and a greater volume of air can be taken into the lungs.

The functional anatomy and biomechanical principles were completed verbally by the student. The assessor asked the student the verbal questions that were completed during class time. The assessor videoed each student, and has supplied a summary of evidence for each student. For the purpose of providing detailed annotated exemplars, some aspects of the student work have been fully transcribed. The exercise physiology principles were completed as a report (in class, supervised).
<table>
<thead>
<tr>
<th>Achievement</th>
<th>Merit</th>
<th>Excellence</th>
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<tbody>
<tr>
<td><strong>Demonstrate understanding</strong> of the function of the body as it relates to the performance of physical activity.</td>
<td><strong>Demonstrate in-depth understanding</strong> of the function of the body as it relates to the performance of physical activity.</td>
<td><strong>Demonstrate comprehensive understanding</strong> of the function of the body as it relates to the performance of physical activity.</td>
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**Explanation**

Demonstrate understanding involves giving an account of, and/or giving details of characteristics. For example, anatomical movement is considered a description of the way the joint moves.

Demonstrate in-depth understanding involves explaining how and why the function of the body is related to the performance of physical activity.

Demonstrate comprehensive understanding involves a depth and breadth of knowledge, including:

- the relationship between anatomical structure and the performance of a physical activity
- the use of biomechanical principles to explain the performance of a physical activity
- physiological responses to the intensity of the exercise

**Questions to ask students**

1. Consider the movement that occurs at the **knee or elbow** for a FREE THROW in basketball.
   - Explain how this movement occurs
   - Explain why this movement occurs (include the key movement, joint used, agonist and antagonist muscle)

2. Consider the biomechanical principles involved in a FREE THROW in basketball.
   - Explain how they are used to produce a successful free throw
   - Explain why they are used to produce a successful free throw

3. Explain in detail how anatomical structure can affect/limit the performance of your FREE THROW.

4. Explain in detail how biomechanical principles can affect/limit the performance of your FREE THROW.

**Authority/teacher response**

- **Correct**
  - Shows breadth/depth in anatomical structure and the performance
  - Shows breadth/depth in biomechanical principles and the performance

**Questions to ask students**

1. Consider the movement that occurs at the **hip or shoulder** for a LAY UP in basketball.
   - Explain how this movement occurs
   - Explain why this movement occurs (include the key movement, joint used, agonist and antagonist muscle)

2. Consider the biomechanical principles involved in a LAY UP in basketball.
   - Explain how they are used to produce a successful lay up
   - Explain why they are used to produce a successful lay up

3. Explain in detail how anatomical structure can affect/limit the performance of your LAY UP.

4. Explain in detail how biomechanical principles can affect/limit the performance of your LAY UP.

**Authority/teacher response**

- **Correct**
  - Shows breadth/depth in anatomical structure and the performance
  - Shows breadth/depth in biomechanical principles and the performance

**Questions to ask students**

- **Correct**
  - Shows breadth/depth in anatomical structure and the performance
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Teacher Comment:

- Well done in the verbal response for anatomy. Unfortunately, your written report for the physiology section lacked detail. You could describe the response/energy system, but needed to say how and why they occur. Some good examples provided.

Final Grade Awarded: [Grade]

Final grades will be decided using a professional judgement based on the holistic examination of the evidence provided against the criteria of the achievement standard.