

Internal Assessment Resource

Physical Education Level 1

EXPIRED

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| This resource supports assessment against:  Achievement Standard 90963 version 3  Demonstrate understanding of the function of the body as it relates to the performance of physical activity |
| Resource title: Discovery 101 |
| 5 credits |
| This resource:   * Clarifies the requirements of the standard * Supports good assessment practice * Should be subjected to the school’s usual assessment quality assurance process * Should be modified to make the context relevant to students in their school environment and ensure that submitted evidence is authentic |

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| Date version published by Ministry of Education | February 2015 Version 3  To support internal assessment from 2015 |
| Quality assurance status | These materials have been quality assured by NZQA.  NZQA Approved number A-A-02-2015-90963-02-4558 |
| Authenticity of evidence | Teachers must manage authenticity for any assessment from a public source, because students may have access to the assessment schedule or student exemplar material.  Using this assessment resource without modification may mean that students’ work is not authentic. The teacher may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform. |

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| Internal Assessment Resource |

Achievement Standard Physical Education 90963: Demonstrate understanding of the function of the body as it relates to the performance of physical activity

Resource reference: Physical Education 1.2B v3

Resource title: Discovery 101

Credits: 5

Teacher guidelines

The following guidelines are designed to ensure that teachers can carry out valid and consistent assessment using this internal assessment resource.

Teachers need to be very familiar with the outcome being assessed by Achievement Standard Physical Education 90963. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing students against it.

Context/setting

This activity requires students to participate in a discovery programme that enables them to demonstrate their understanding of how and why the body functions in relation to the performance of specific sports/skill(s).

The sports/skill(s) chosen and student evidence need to incorporate aspects of anatomy, biomechanics and exercise physiology.

As the students exercise and record observations about how their body functions and responds in doing this exercise, students can at any time throughout the 3 week period have a conversation with the teacher about what they have discovered.

The student will need to practically demonstrate and verbally articulate their understanding of the skill/s and how the body functions within the performance of them. Students must make observations and draw conclusions about aspects of the three key areas: Anatomy, Biomechanics and Exercise Physiology. For exercise physiology, students may need to relate this to the sport as a whole and the position they would play.

The student may choose to speak with the teacher on up to 3 occasions: 1 for each aspect of body functions. For example, a student may tell you about the anatomy and biomechanics of a lineout throw in rugby, and the exercise physiology requirements of a hooker.

Teachers could record these conversations using a dictaphone, digital recorder or video recorder.

Conditions

This assessment activity will take place through ongoing assessment opportunities during in-class time

Evidence of comprehensive understanding will come from one on one demonstrations and conversations with the student.

You may wish to set up specific interview times for your students or allow them to see you during the normal lesson(s).

Resource requirements

* Exercise facilities (e.g. gym, sports fields, track, swimming pool, dance studio)
* Exercise equipment such as weights.

Additional information

Teachers need to adapt or modify assessment modes to reflect the needs of their students, the nature/context of your teaching and learning programme and the facilities/environment you work in.

Teachers might select other appropriate modes of assessment. These include:

* self-assessment
* peer assessment
* written task
* electronic portfolio
* Blog/Wiki
* visual portfolio.

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| Achievement | Achievement with Merit | Achievement with Excellence |
| Demonstrate understanding of the function of the body as it relates to the performance of physical activity. | Demonstrate in-depth understanding of the function of the body as it relates to the performance of physical activity. | Demonstrate comprehensive understanding of the function of the body as it relates to the performance of physical activity. |

Student instructions

Introduction

This assessment activity requires you to choose a sport, or a skill(s) within that sport, that you want to practice.

You will use different skills within a sport or other physical activities to develop your understanding of the aspects of anatomy, biomechanics, and physiological responses of the functioning body.

Once you are confident that you can explain your understanding of what your body is doing in relation to the physical activity/ies, give a verbal account to your teacher.

You will be assessed on how well you understand how the body functions in performing physical activity.

Task

Choose a sport, or a skill(s) within that sport, that you want to practice.

Examples include:

* Goal kicking for rugby
* Playing touch
* Goal shooting for netball
* Sport climbing
* Weight training
* Dance
* Swimming
* Aerobic exercises.

As you practise, consider what is happening in the performance of your chosen activity in relation to:

* basic anatomy
* basic biomechanics
* basic exercise physiology.

Once you are confident that you can express your understanding of what your body is doing in relation to the physical activity/ies, demonstrate your activity and give a verbal account to your teacher of what you have discovered.

Where applicable, include in your account and practical demonstration:

#### Basic Anatomy

* What type of movement is occurring at your joints?
* Explain how and why this movement occurs (consider joint type, movement made, agonist and antagonist muscle)
* How and why do these muscles and movements help your performance? Give examples to support your answer.

#### Basic Biomechanics

From the list below, consider which biomechanical principles are most relevant to your chosen physical activity:

* How and why does the concept of projectile motion affect your activity?
* Do any of Newton’s Laws (Inertia, Acceleration, Action/Reaction) affect your activity? Explain how and why
* How does force summation relate to your activity? Explain how and why with examples
* How does balance and stability affect your activity? Explain how and why with examples
* Explain what type of levers are involved in your activity and how do they affect the performance of your activity?

#### Basic exercise physiology

* What is the major energy system used in your activity or sport and how does it work for you? Use examples to support your answer from your practical experience
* What are the short-term (acute) physiological responses to your activity and why do these occur? (consider each of the muscular, cardio-vascular and respiratory systems)
* If you were to follow a prescribed training programme over a period of 6 months to a year, what long term (chronic) physiological adaptations might you expect to see?

Assessment schedule: Physical Education 90963 Discovery 101

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The student demonstrates understanding of the function of the body as it relates to the performance of physical activity.  The student completes a range of suitable large muscle locomotor-type physical activities involved in sport or exercise, e.g. fitness, dance, outdoor education, games, team-based sport, or te ao kori.  The student observes how their body functions in these activities.  The student describes more than one characteristic of how the human body works in relation to physical activity, e.g. the way a joint moves in a specific physical activity; changes in heart rate, blood pressure.  These characteristics might include, for example (where relevant to the context): basic functional anatomy, e.g. anatomical movement, bones and muscles involved in the movement, agonists, antagonists; basic principles of biomechanics, e.g. stability, force summation, levers; basic physiological responses to large muscle locomotor-type activities, e.g. acute and chronic response to training, energy systems.  For example:  Anatomy: Kicking motion  In the preparation phase of a soccer kick, the right leg moves back in a back swing. The movement is hip extension. The agonist is the gluteus maximus and the hamstring. The antagonist is the hip flexors  Biomechanics: Kicking motion  I need to exert enough force on the ball so that I can move it. This is overcoming inertia. The heavier the ball the more force I need to apply.  Exercise Physiology  Short-term/acute physiological changes – when I played soccer, I had an increased heart rate, increased breathing rate, muscles get warmer and I was sweating. I use the anaerobic energy systems when I do fast runs around to tackle the ball, but use the aerobic system to last the game. | The student demonstrates in-depth understanding of the function of the body as it relates to the performance of physical activity.  The student completes a range of suitable large muscle locomotor-type physical activities involved in sport or exercise, e.g. fitness, dance, outdoor education, games, team-based sport, or te ao kori.  The student observes how their body functions in these activities.  The student gives an account of, and/or gives details of more than one characteristic of how the human body works in relation to physical activity, e.g. the way a joint moves in a specific physical activity; changes in heart rate, blood pressure.  These characteristics might include, for example (where relevant to the context): basic functional anatomy, e.g. anatomical movement, bones and muscles involved in the movement, agonists, antagonists; basic principles of biomechanics, e.g. stability, force summation, levers; basic physiological responses to large muscle locomotor-type activities, e.g. acute and chronic response to training, energy systems.  The student explains how and why the body functions in the manner described in performing the physical activities completed.  For example:  Anatomy: Kicking motion (partial example)  In the preparation phase of a soccer kick, the right leg moves back in a back swing. The movement is hip extension which involves the ball and socket joint. The agonist is the gluteus maximus and the hamstring. The antagonist is the hip flexors. The right knee which is a hinge joint also flexes. The muscles that cause knee flexion are the hamstrings which are the agonist, and the antagonist muscle is the quadriceps. This movement occurs because muscles work in pairs across a joint. When one muscle contracts, the other one relaxes.  Biomechanics: kicking motion  I need to exert enough force on the ball so that I can move it. This is overcoming inertia. The heavier the ball the more force I need to apply. This is applying Newtons 1st Law. ‘An object will remain at rest unless acted upon by an external force’ so the soccer ball will stay stationary until you kick it. For Newtons 2nd law, (the law of acceleration) I had to kick the ball hard if I wanted it to go further. So the harder I kicked it, the further it went which was good for the long shots I needed to make to another player.  Exercise Physiology  When I played soccer, the immediate effects on my muscular system were that my muscles got warmer and were more flexible. This is because they are receiving more blood and oxygen and they increase in temperature. I was sweating because my body temperature had increased, and sweating is a response to cool it down. In my cardiovascular system, my heart rate increased because more blood is being pumped around the body to the working muscles. For my respiratory system, my breathing rate increased as I was needing to take in more oxygen to supply to the muscles.  I used the ATP-CP system which is the main source of energy for up to 10 seconds, like sprinting around to tackle the ball, and used the lactic system which goes up to 2 minutes when I was defending a good player. I used the aerobic system to last the entire game which is any activity over 20 minutes.  If I trained for over 6 months for this sport, then the long term effects would be that my muscles would get larger and stronger, they can store more energy (glycogen) and the heart would get larger. Because the heart is larger, it is able to work more efficiently, so my resting heart rate will be lower, and I can recover quicker after a game. My lungs would be stronger as I would be able to breathe in and out more air, which means more oxygen. | The student demonstrates comprehensive understanding of the function of the body as it relates to the performance of physical activity.  The student completes a range of suitable large muscle locomotor-type physical activities involved in sport or exercise, e.g. fitness, dance, outdoor education, games, team-based sport, or te ao kori.  The student observes how their body functions in these activities.  The student gives an account of, and/or gives details of more than one characteristic of how the human body works in relation to physical activity, e.g. the way a joint moves in a specific physical activity; changes in heart rate, blood pressure.  These characteristics might include, for example (where relevant to the context): basic functional anatomy, e.g. anatomical movement, bones and muscles involved in the movement, agonists, antagonists; basic principles of biomechanics, e.g. stability, force summation, levers; basic physiological responses to large muscle locomotor-type activities, e.g. acute and chronic response to training, energy systems.  The student explains how and why the body functions in the manner described in performing the physical activities completed.  The student shows breadth and depth of knowledge by (for example), explaining how anatomical structure affects or limits the performance of a physical activity; using biomechanical principles to explain the performance of a physical activity; explaining how physical activity and how the physiological responses (e.g. heart rate) relate to the intensity of a physical activity.  For example:  Anatomy: Kicking motion (partial example)  In the preparation phase of a soccer kick, the right leg moves back in a back swing. The movement is hip extension which involves the ball and socket joint. The agonist is the gluteus maximus and the hamstring. The antagonist is the hip flexors. The right knee which is a hinge joint also flexes. The muscles that cause knee flexion are the hamstrings which are the agonist, and the antagonist muscle is the quadriceps. This movement occurs because muscles work in pairs across a joint. When one muscle contracts, the other one relaxes.  *In the next phase of the soccer kick, (making contact with the ball), the right hip now moves forward, so the movement is hip flexion. This means that the quadriceps is now the agonist muscles and the gluteus maximus is the antagonist. The right knee has moved into extension, therefore the quadriceps are the agonist for this movement and the antagonist is the hamstrings. At this point the hip joint takes a back seat to the powerful movement of the knee, as the lower leg snaps forward and the foot, toes pointed down (plantarflexion), smacks into the lower middle of the ball.*  Biomechanics: Kicking motion  I need to exert enough force on the ball so that I can move it. This is overcoming inertia. The heavier the ball the more force I need to apply. This is applying Newtons 1st Law. ‘An object will remain at rest unless acted upon by an external force’ so the soccer ball will stay stationary until you kick it. I also need to consider Newtons 2nd Law, ‘when a force acts upon a mass, the result is the acceleration of that mass’ so this means that the harder I kick the ball, the further it will travel. It depends on the mass of the ball (how heavy it is), eg, if kicking a bowling ball, it would not travel as far as a soccer ball because it has more mass (F = m x a).  I need to consider force summation when I kick the soccer ball, as the bigger stronger muscles of the upper leg /torso(quads, hamstrings, abdominals) initiate the movement followed by the muscles of the lower leg (tibialis anterior, gastrocnemius) and finally the foot (plantar flexors).  To gain maximum force in the kick all muscles will be used. The muscles need to be used sequentially. The fine movements of the muscles in my foot allow for better direction of the ball.  The entire movement must be completed over a stable base as this will ensure maximum force. For this my plant foot needs to be under my head when I kick the ball; my shoulder and lead hand need to be forward of this.  Exercise Physiology  When I played soccer, the immediate effects on my muscular system were that my muscles got warmer and were more flexible. This is because they are receiving more blood and oxygen and they increase in temperature. I was sweating because my body temperature had increased, and sweating is a response to cool it down. In my cardiovascular system, my heart rate increased from 64 beats per minute to 86 beats per minute, because I was needing more blood to be pumped around the body to my muscles. For my respiratory system, my breathing rate increased as I was taking in more oxygen and I felt out of breath and felt really tired quickly, which shows that my breathing rate went from 14 breathes per minute to 38. I think that if I were to train for 6 months to a year, the long term effects on my muscular, cardiovascular and respiratory systems would be …. because …..  I used the ATP-CP system which is the main source of energy for up to 10 seconds, like sprinting around to tackle the ball. This system does not require oxygen and so does not cause a build up of lactic acid compared to the lactic acid system which goes up to 2 minutes like when I had to defend a good player. I used the aerobic system to last the entire game which is any activity over 20 minutes and uses oxygen. Soccer uses all three systems because of the nature of the game. You have to sprint in some parts of the game and then also are continuously jogging around to defend and attack well over an hour. |

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