UP, DOWN AND ALL AROUND

Primary Connections, 2012
1. Reference to teaching resource (100 words)

The curriculum unit I have chosen to adapt is the Primary Connections (2012) – *Up, down and all around* – Year 1, Earth and space sciences, Science Unit.

The adapted lessons are (1) *I Spy* (2) *Garden Grooming* – Part a. (3) *Garden Grooming* – Part b. (4) *Daily Changes* (5) *Seasonal Traits* and (6) *Time Spy*.

The science unit *Up, down and all around* can be downloaded at https://www.scootle.edu.au/

2. Curriculum (150 words)

State how your selection of activities relate the Australian Curriculum in terms of Year Level and Content Descriptions for Science Understanding; Science as Human Endeavour and Science Inquiry Skills.

Lessons 1-6 embed Australian Curriculum (ACARA, 2012) content and Science Strands, Science Understanding, Science as a Human Endeavour and Science Inquiry Skills for year 1. The content descriptions covered across these lessons include observing changes in the sky and landscape (ACSSU019), asking questions about and describing changes in objects and events (ACSHE021), using science when caring for the environment and living things (ACSHE022), posing questions and making predictions about familiar objects and events (ACSIS025), using a range of methods (including drawing) to sort information (ACSIS025), comparing observations with those of others (ACSIS213) and representing observations in a variety of ways (ACSIS029).

3. Safety (150 words plus Appendix)

Conduct a formal Curriculum Activity Risk Assessment (CARA) and include this in Appendix One of your assignment. In this section you will need to describe how you identified the risks associated with any activities and how you managed these risks. Appendix One will be checked as demonstrating your capacity to undertake a formal risk assessment. Please see the Learn JCU Safety Module for further advice, links and information.

The activities conducted in all lessons are considered low risk. Despite there being little or minimal risk involved in these activities, safety measures will still be undertaken to ensure a safe learning
environment. Hats will be worn and sunscreen will be applied as we will be conducting outdoor and gardening activities. We will be conducting these activities early in the morning to minimise risk of sun exposure. Gloves will be used when handling organic matter, fertilised soil and plants. Safe hygiene standards will be discussed and maintained. Rules and safety procedures will be discussed prior to each hands-on activity. Night-time activities will be conducted at home under the supervision of parents. All outdoor activities will be conducted away from contact with animals, machinery and will be conducted in familiar fenced environments.

4. Concept Knowledge / Science Understanding (500 words)

In this section you must explain what concepts you wanted the children to learn. In no more than 400 words, succinctly and accurately develop scientific explanations for the phenomenon at a Year 10 level and include APA referencing to your sources you used to develop your explanations.

This unit of discovery is designed to make children aware of the changes that are constantly occurring in the land and sky. Over a series of six lessons, children will investigate how and why features in their (home) environment change over varying periods of time.

In lesson one, they will discover that these features change as a result of natural processes e.g. seasons and weather. Weather and climate will be explained in terms of the strength of radiation from the sun which determines the temperature of the earth, the sun’s position in relation to its observers and the arc of the sun which varies in height depending on the season (Bureau of Meteorology, 2014). The arc is higher in summer and the sun’s rays are more direct, in winter the rays are angled and the arc is lower in the sky (Primary Connections, 2012).

Lesson two (a) will explain to children the cause and effect relationship between the natural elements and changes to features in their environment. They will discover how weather can promote growth as well as become a destructive force. Children will identify natural and man-made features and investigate how they change over long periods of time depending on their composition. Concepts about plant growth and the elements needed to sustain life will be a feature in lesson two and children will compare and categorise objects constructed from natural materials with objects constructed from man-made materials.

In lesson three, children will observe the day/night pattern and how this recurring pattern is responsible for changes in the environment. They will investigate how many features respond to day light and night and record their findings. Patterns of daylight behaviour (diurnal patterns) of plants,
animals and human behaviour (Primary Connections, 2012) will be discussed during this lesson as well as their nocturnal habits and patterns. Environmental features that occur during both the presence and absence of sunlight will also be explained. Celestial phenomenon will be investigated and discussed e.g. how and when Venus and Mars are visible to the naked eye and how turbulent wind in the Earth’s atmosphere interferes with the passage of light from stars and appear to make them ‘twinkle’ (Primary Connections, 2012). Seasonal patterns of growth and behaviour will be introduced at the conclusion of this lesson and students will record their findings in a science journal.

Lesson four will elaborate on the seasons and how they are caused by three factors: the revolution of earth around the sun, the tilt of the Earth in relation to the sun and the position of the Earth within our solar system. They will investigate how different areas in Australia observe differing seasonal patterns and record the affect each season has on the observable features in their local environment. Changing weather conditions will affect the availability of food and water and the consequences of drought and flood will be examined.

Knowledge and understanding is consolidated in lesson five and the focus here will be on summative assessment. Children will be able to identify and describe features of the landscape and sky and describe how the weather and time affect and contribute to patterns of growth and behaviour.

5. Implementation (250 words)

Describe what you did, the chosen activities and the given time frame. Describe possible differences you made from/to the chosen teaching resource. Give reasons for your decision-making.

This science unit was conducted over a period of 2 weeks. Lessons were approximately 45min to 1 hour each every Wednesday, Thursday and Friday afternoon. Lessons from Primary Connections, Up, down and all around Science Unit were adapted to take into consideration the unique local environment and the remoteness of the setting. The lessons were selected and differentiated to include children from eKindy to Year One. I included several play based activities for a kindy child to assess his understanding of concepts and observations. I added a managed features model activity for a prep child in lieu of some written activities.

We are in a unique situation here at the cattle station. The three children I teach are learning through Capricornia School of Distance Education on air lessons. The 49000 acres of cattle country they live on look after is their life and they rarely get to see the changing world outside the farm. I took
advantage of the changes that actually do go on around them here and incorporated some of the long history of the cattle station into their lessons. Natural phenomenon of drought, flood and bushfire are a continual threat here and these events continually change the shape and characteristics of the land. I incorporated how these events affect how their family go about their daily lives and we observe how living things can flourish or perish according to the changes in season.

I believe I needed to make these lessons relevant to their situation and in doing so would be able to share and expand on the knowledge they already have of their environment and local landscape.

6. Aboriginal and Torres Strait Islander Perspectives (150)

Explain how indigenous perspectives can be incorporated into this sequence of activity-based learning. Consider knowledge and understanding relevant to your activities. The Primary Connections website may be of assistance and will other sources of information. (Please reference other sources using APA)

The formation of the landscape and observation of its features are based on western explanations as referred to in Primary Connections – Up, down and all around. ‘The Rainbow Serpent’ was an engaging dreamtime story that we shared at the beginning of the science unit. This story explains how a huge serpent created the landscape from the mountains to the rivers. It sparked their curiosity and encouraged the children to consider how people might share different beliefs and histories to our own.

If we were to extend on Indigenous perspectives we would research the indigenous history of the local area and visit the nearby rock paintings. I would then link this historical site to the ‘Time Spy’ science lesson where we would discuss how our land is like a museum, a special place where the farming environment has been ever-changing but some very important features have been preserved through time.
7. Record of your teaching activities and reasoning (800 words + 16 photographs)

7.1. Submit *up to five* photographs of your apparatus and activity set-up without children and write short captions explaining each photograph.

The sequence of photographs above were taken in the lesson Garden Grooming Part 2. In this activity we conducted observations of what plants need to survive. Plant 1. was given sunlight, water and soil – Plant 2. was given sunlight and soil only – Plant 3. was given water and sunlight only - Plant 4. was given water and soil but was kept in darkness. Over the course of the next five days we observed the changes to the plant in each pot and recorded our findings.

In Garden Grooming Part Two, we played the ‘Needs Matching Game’. The game consolidated awareness of the five basic needs that living things require to survive.
7.2. Submit ten photographs of the children undertaking your chosen sequence of hands-on activities. If there is no parental permission or release form do not include a child's face. Caption each photograph and describe what learning activity is what is happening in each photograph. Identify and describe the curriculum and pedagogical principles at work that you have captured by digital imagery. State why these selected principles are important in teaching science. You may wish to describe the 5Es in process, show a child asking or answering a question, or demonstrating different science inquiry skills. It’s your decision to make. By selecting and captioning photographs of an actual science learning experience you are asked to demonstrate that you can make explicit links between the theory of good teaching in science and the actual practice of teaching science.

Lesson 1. ‘I Spy’ – In this photograph Lily is taking photos in order to identify and compare changes in the environment over time. She is developing science inquiry skills - planning and conducting. She is collecting data in order to carry out her investigation. Lily is working within the Explore stage (provide hands on experience) of the 5 E’s instructional model and is using everyday literacies to develop her knowledge and scientific literacy.

In Garden Grooming Part 1 we created a mini environment which allowed us to closely observe the changes that occur in an environment. Our environment contained examples of natural, man-made and ‘not sure’ objects and plants. We predicted and recorded the changes that we thought would occur in each object over a period of one day, one month and one year.
During Lesson 1. The ‘I Spy’ discovery walk, Lily wondered why one of the huge bottle trees on the property had fallen down. This activity had connected the children with nature and Lily had begun to develop her ‘feeling for the earth’ (Whitehouse, 2012). Lily was learning in stage 3 of Joseph Cornell’s Flow Learning. She was learning by direct personal discovery and experiential understanding. Lily is learning through an integrated affective approach – engaging the thinking, feeling mind through emotion and curiosity.

Prior to Lesson 2 “Garden Grooming – Part 1’ we went on a discovery walk to observe some of the changes the weather has made to man-made features in our local environment. The children were working within the Explore phase of the 5 E’s Inquiry model by engaging in hands-on experiences. This activity was part of an integrated affective approach to learning where the children were feeling happy and confident whilst working in a familiar environment. The hands-on learning was meaningful and entirely relevant to their daily lives as well as introducing the concepts to be covered in the pending lesson.

In lesson 2. ‘Garden Grooming -Part 1’ Lily and Jo created a mini environment. The purpose of this activity was to observe what might happen to natural and man-made objects under natural weather conditions. Lesson 2 provided hands-on, shared experiences of changes that occur in the landscape and engaged discussion through sorting items into categories. Lesson 2 falls in the Explore phase of the 5 E’s and the children were working to develop science inquiry skills- planning and conducting. They were making decisions about how best to carry out this investigation and considered how to collect the data.
A feature of eKindy is learning through play. To engage Andy in our unit I provided him with more hands-on play based activities so he could express his understandings and knowledge of science. Here he was using his everyday literacies (expressing through playdoh play) to develop new scientific literacies (modelling representation of a managed landscape). Andy was working in the Explain phase of the 5 E’s Inquiry Model by representing his developing conceptual understanding of the managed environment.

After discussing seasons on the farm in Lesson 4 ‘Seasonal Traits’ the children created a model of their environment showing what happens on the farm in spring. They were to show natural, managed and constructed aspects in their environment. In this activity they were representing their understanding of changes in the seasons. This activity also served as summative assessment. The children were working in the Explain phase of the 5 E’s Inquiry Model by representing their developing understanding of the concept of seasonal change and the features of the landscape.

This photograph shows Jo modelling at Prep level in a similar activity to Andy (above). Jo was required to represent a managed environment that met the five needs of living things. The context was their local environment (the farm) and here Joey was working in the Explain phase of the 5 E’s Inquiry Model.
After observing our managed garden environment for over a week, the children were asked to draw what they know about ‘then’ and ‘now’ and the changes that occurred to the objects in the garden. They observed both growth and deterioration and applied that to the big picture concept of their local environment. They drew their representations on a whiteboard and labelled their features. This activity required them to process and analyse data and information from what they had learned during the last week.

In Lesson 3 – ‘Daily Changes’ Andy is using a simple computer drawing program to represent what he saw in the night sky. He is developing an understanding of the Earth’s place in the cosmos using the science inquiry skill – communicating. He is conveying ideas and knowledge through computer technologies. Andy is working within the Evaluate stage of the 5 E’s Inquiry model by representing his understandings and scientific views of his world.

7.3. Discuss the concept of assessment and how you used it within this learning sequence. Show how you assessed the children’s learning by including a copy or a photograph of a child’s work / assessment sample. What meaning do you derive from this sample? What learning can be demonstrated?

Throughout this learning sequence I conducted formative and summative assessment. Lessons 1, 2(a) and 2(b) provided opportunities for formative assessment while lessons 3, 4 and 5 provided opportunities for summative assessment or assessment of science understanding and inquiry skills.
After discussing seasons on the farm in Lesson 4 ‘Seasonal Traits’ the children created a model of their environment showing what happens on their farm in spring. They were to show natural, managed and constructed aspects in their environment. In this activity they were representing their understanding of changes in the seasons and how the seasons have specific traits and affect physical and biological features in their managed environment (e.g. spring calves are born and there is expected rain). This activity served as summative assessment. The children were working in the Explain phase of the 5 E’s Inquiry Model by representing their developing understanding of the concept of seasonal change and the features of the landscape.

8. Reflection (500 words)

This science unit of learning followed an integrated approach to learning. It was a hands-on unit which incorporated direct teaching methods, outdoor activities, experimentation, indigenous perspectives and stories, observations, games, technology and play based learning. As we had consistent links and references to the children’s living and lifestyle it also incorporated an affective approach as they felt comfortable learning in their own environment. The children are naturally connected to their environment and nature here at the farm which provides them with extensive knowledge of farm practices and processes. While this can be an advantage and provide the children with facts and certain knowledge, they have never investigated the deeper understandings of ‘why’ these happenings take place.

Whitehouse (2012), explains the value of experiences and developing a ‘feeling for the earth’ in order to develop a sense of responsible stewardship which is so important growing up in the bush. In order to fully understand the subtle changes going on around the farm we needed to investigate the phenomenon and the causes further. This unit provided opportunities for outdoor exploration of these phenomena and for development of new knowledge and scientific understandings.

While planning this unit for the three children here at the farm I knew there was a need to differentiate and modify the lessons. While planning for year one outcomes I also had to incorporate play based learning and assessment for eKindy as well as Prep. As this was a very engaging and hands-on unit it
was quite easy to differentiate across the three year levels whilst making sure I kept the activities relevant and interesting.

The children reacted well to the activities as they are continually looking for every opportunity to leave the classroom and venture outside. They were interested in the gardening aspect of the unit as they have never had success keeping a garden here due to the possums. We found ways around these problems and that became a learning activity in itself. There are countless opportunities for extension in this unit and the children are really interested in the space sciences so we will be exploring those concepts further in the future.

Summative and formative assessment opportunities were effective and the children found them engaging. It was easy to gauge their learning through discussion as well as through concrete representation. Conducting three levels of assessment was a little time consuming and time is a factor I need to remain aware of in such a short unit of work.

During this unit I discovered how when the children are passionate about the reasons behind their lesson, it is much easier to conduct an interesting, engaging unit of work. They gain so much more from experiential learning than if they were sitting at a desk listening to me talk facts. As explained by Whitehouse (2012), information is not enough to develop an ethic of care and full feelings of empathy and because of that important statement I will be conducting many more hands-on outdoor activities with my children in the future.

9. References (APA).


Appendix A. Curriculum Activity Risk Assessment.

<table>
<thead>
<tr>
<th>Date</th>
<th>Risk</th>
<th>Likelihood</th>
<th>Action required/approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2023</td>
<td>High</td>
<td>Some chance of an accident or injury</td>
<td>Document to be completed, parent or guardian permission required.</td>
</tr>
<tr>
<td>May 2023</td>
<td>Extreme</td>
<td>High chance of a serious student and injury requiring medical treatment</td>
<td>Document to be completed, parent or guardian permission required.</td>
</tr>
</tbody>
</table>

Minimum supervision:
- Adequate adult supervision must be provided. A broad range of variables will affect your decision about what constitutes adequate supervision, for example:
  - nature of the activity conducted
  - number of students/size of group
  - needs of students and their expected capabilities (i.e., experience, competence, fitness)
  - the leader’s experience and knowledge of the activity
  - educational and safety conditions
  - supervision ratios
- The activity leader is responsible for ensuring adequate supervision.
- If an adult other than a registered teacher is engaged for instruction, a teacher should be present to take overall responsibility.
- Blue Card requirements must be adhered to.
- Please provide information on supervision:
  - Students will be supervised by an adult pre-service teacher holding a current Blue Card. The supervision ratio is 1:5.

Minimum activity-specific qualifications for supervisors:
- Relevant qualifications will depend on the nature of the activity, but as a minimum you should consider:
  - that there are sufficient adults with current First Aid qualifications including Cardiopulmonary Resuscitation (CPR) or to assist in first aid situations (e.g., trained in AED, etc.),
  - operating more than one hour away from emergency services, current workplace First Aid,
  - depending on the nature of the activity, competence may be sufficient for the activity leader rather than a formal qualification.

Case study: A teacher is planning an activity for their students. The activity involves a visit to a wildlife sanctuary. The teacher is considering the potential risks and reviewing their risk assessment matrix. They decide to follow the guidelines set out in the document, ensuring adequate supervision and providing relevant qualifications. They also consider the nature of the activity and the students' capabilities, ensuring a balance between safety and learning opportunities.
Minimum activity-specific equipment/facilities
Consider the equipment and facilities required for the activity. Depending on the nature of the activity, this may include:
- First Aid kit (including sufficient and suitable bandages, ice packs, etc as appropriate)
- Communication equipment e.g. phones, link at location, satellite phones, whistlers, wireless, walkie talkies, UHF/VHF radio, PLB (person locator beacon)
- Drinking water (students should not share drinking containers)
- Sun safety equipment if outdoors (hat, sunscreen, shirt, shade, etc)
- Appropriate clothing (consider weather conditions if outdoors)
- Injury management procedure (including head injuries where this is a possibility) in place
- Suitable personal protective equipment
- All equipment and facilities should comply with relevant safety standards.

Please provide information on activity-specific equipment/facilities:
Current first aid certificate and first aid kit in place in the classroom. Mobile first aid kit available for outdoor activities. Walkie Talkie on hand to communicate with Headstede. Suitable sun safety equipment used and safety apparels e.g. gloves on hand for activities.

Governing bodies/associations
Guidelines/Code of practice are available for many activities. Refer to the relevant governing body association, if one exists.
- If you are organizing sporting competitions or events, refer to Queensland School Sport Unit.

Please provide information on governing bodies/associations, if relevant:
Cap sustain in Home Care: Duty of Care

Activity-specific hazards/risks and suggested control measures
Consider the potential hazards and risks involved with this activity and control measures that will be implemented to minimise these risks. Depending on the nature of the activity, this may include:
- Establish processes to maintain safe hygiene standards
- Be prepared to deal with student/injuries/accidents involving bodily fluids that are possible given the nature of the activity and students. Ensure familiarity with Management of Prescribed Contagious Conditions and Infection Control Guideline.
- Provide/Instruct in rules, safety procedures, safe handling of equipment and prerequisite skills before students commence the activity
- Follow progressive and sequential skills development
- Monitor student numbers and available space
- Provide complete safety instructions on the use of all equipment
- If outdoors, adopt sun-safe strategies e.g. schedule activity early morning/late afternoon; shaded areas; hats, sun-smart clothing, sun-screen
- Check site for hazards and implement controls as necessary
- Check site for poisonous plants/dangerous animals
- Establish safe, designated areas for people and vehicles

- Refer to Chemical Hazards in the Curriculum guideline and related Guidance Notes if hazardous substances are being used
- Establish safety zones for use of equipment, if relevant
- Ensure electrical items are maintained as required, and visually inspected before use
- If students with medical conditions are involved, ensure that relevant medical/emergency plant and medications are available (insulin, Ventolin® Epipen®, etc)
- Refer to individual Education Plan/Educational Adjustment Plan/Behaviour Management Plan and other student documents
- Where necessary, obtain advice from relevant advisory visiting teachers or specialist teachers
- If the activity involves manual tasks, undertake a risk management process to prevent or minimise the risk of injuries
- Procedures should be in place to bail, disrobe or protect (e.g. tape) the wearing of jewellery
- For sporting activities:
  o Assess suitability of surface: playing field (loose items, debris, potholes, ditches in ground, line markers, or other hazards) and dampness before and during activity, and that the surface is non-slip, even and firm
  o Modify activities to match the skill and fitness levels of students
  o Have appropriate warm-up and warm-down activities
  o Continually monitor students for signs of fatigue and exhaustion
  o If spectacles need to be worn during sports activities/matches and training sessions, ensure that they have plastic frames and plastic lenses. A band should also hold the spectacles securely
- For outdoor activities:
  o Assess weather conditions before and during activity (e.g. temperature, storms)
  o Site activities away from buildings, pedestrians and other activities (as appropriate)
  o Consider hazards associated with types of fencing materials, gates and other infrastructure (e.g. barbed wire, star pokes, electrocution, rough timber, uneven terrain) and the risk of students being injured by these materials and conditions.

Please provide information on hazards/risks and planned control measures:
Weather conditions will be assesses the morning of the activity.
Children’s activities will be conducted away from hazardous machinery and livestock.
Children’s activities will not be conducted within sight or walking distance of dams or water hazards.
<table>
<thead>
<tr>
<th>Monitor and Review (to be completed during or after the activity)</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are the control measures still effective?</td>
<td></td>
<td></td>
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<tr>
<td>Have there been any changes?</td>
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<td></td>
</tr>
<tr>
<td>Are further actions required?</td>
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Useful activity-specific links:
- First Aid [http://prp.det.qld.gov.au/or/hi/workplace/Pages/First-Aid.aspx](http://prp.det.qld.gov.au/or/hi/workplace/Pages/First-Aid.aspx)

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Signature of parental Permission.

ED3092 Science Assessment Activity 2014.

This is to certify that Karen Thompson has obtained permission from a parent/guardian of: Lily Mulcahy, Jo Mulcahy and Andy Mulcahy to complete activities with them and allow them to be photographed for assessment purposes.

I, Angela Mulcahy do hereby give permission for my children Lily, Jo and Andy Mulcahy to participate in scientific activities and be photographed by Karen Thompson as part of her ED3092 Assessment.

Student Signature:

Karen Thompson

Parent/Guardian Signature:

Angela Mulcahy