



GRADE 5/6
TERM 3, 2017



INQUIRY

“Our Future World”



PROJECT:



CREATING A SUSTAINABLE URBAN ENVIRONMENT



NAME: _____

GRADE: _____

GRADE 5/6 PROJECT ON:

CREATING A SUSTAINABLE URBAN ENVIRONMENT

DUE DATE: Tuesday 19th September

You are part of a team of environmental scientists undertaking an environmental impact assessment of an area which has been selected as a potential site for a major residential development.

The team will need to investigate the relationship between geology, landscape, soils, climate, plants and animals with a particular focus on the impact of humans on the local environment.

You will work as a project team with each member negotiating to research, report and present a specific part of the final environmental impact assessment report.

Your group will be given one of the following topics to investigate:

1. Resource Management (Refuse, Reduce, Reuse, Recycle, and Recover Resource)
2. Biodiversity (Habitat loss, Introduced species)
3. Ecosystems
4. Transportation and growing communities
5. Water and soil (including farming practices)

There are four parts to this project:

Part 1: Choose an area within the Merri Creek region. Show on a drawn or printed map. Make sure map shows other natural features such as nearby rivers, bushland, wetland etc.

Mark out where the proposed residential area will be located. (Group Task)

Part 2: You are to research one of the above systems (numbered 1 – 5) and show how these systems will be affected by the development of a residential area. Your team can choose how to present this information. E.g. power point, poster, pamphlet, imovie. (Group Task)

Part 3: Suggest ways to show how the residential area could become less affected by human impact and made more sustainable. This can be included in Part 2 or it can be presented separately. (Group Task)

Part 4: Show the impact on the environment via an experiment. Each member will also need to complete an individual Scientific Report (attached). (Individual Task)

Here are some examples of scientific experiments for each of the 5 systems:

Resource management

- * Impact of rubbish tips on soil (different materials in soil to show biodegradability)
- * Show how food waste can be converted into compost. Show the uses of compost.

Biodiversity

- * Deforestation, removal of vegetation (showing impact of removal of trees on soil e.g. erosion, salinity, etc.)
- * Living things depend on each other and the environment to survive. Design an experiment to show what happens when something is removed from an ecosystem.

Ecosystems – altering abiotic / biotic factors can affect water quality and soil quality.

*What happens when factories / houses dispose of chemicals in drains?

*What is the importance of dead leaves at the base of a tree?

*Create an aquatic ecosystem to show how organisms depend on each other to survive. Or what happens if something is removed from the ecosystem, is it still able to sustain itself?

Transportation

* building roads – impact of constructing roads on the surrounding natural environment.

*The effect of cars / vehicles producing emissions. You could design an experiment to show how CO₂ contributes to global warming.

Water / soil

*Contamination of water in local water ways e.g. detergents used in households or industry nearby, soil contamination via chemical wastes, oil spills etc.

*We know what a plant needs to survive: soil, water, sun. If we change or remove one of these elements how will it affect the plants growth? E.g. too much salt in the soil (salinity) or too much heat, too much water or not enough. Will the plant continue to grow in the same way?

*The importance of worms in soil. Show difference between healthy / unhealthy soil.

Google experiments or you can use the following science experiment ideas site at:

<http://www.sciencefairadventure.com/ProjectDetail.aspx?ProjectID=182>

YOUR GROUP QUESTIONS:

1. Which area are you researching: _____
2. List at least three questions that you have about making your system / area more sustainable:

a) _____

b) _____

c) _____

3. Are any of these questions testable? If so, please describe how you could test it. If these questions are not testable, describe how you could turn them into testable questions. Please remember that a testable question needs to have a manipulated and a responding variable in it and should be written in this format:

What is the effect of _____ on _____?

Sustainability Science Project Plan 2017

(TO BE COMPLETED WITH YOUR GROUP – one per group)

1. Testable Question: (What is the effect of _____ on _____?) e.g. the effect of chemicals (such as pesticides) in soil?
2. How will this testable question help you learn more about the system you are studying for the sustainability community project?
3. Who will be impacted by the results of your experiment? (People should care about the results or the experiment is probably not worth your time).
4. Materials needed (think of everything). Include amounts needed for each.
5. Where will you get each of the materials listed above?

11. What is your prediction (hypothesis)?

I predict _____

because _____

12. What will you measure? (This is the responding variable). How will you measure it?

13. What do you see as your biggest challenge in completing this project?

SCIENTIFIC REPORT

TITLE

Titles should say what you did. It should be brief (aim for ten words or less) and describe the main point of the experiment or investigation. An example of a title would be: "What are the effects of Ultraviolet Light on Borax Crystal Growth Rate". If you can, begin your title using a keyword rather than an article like 'The' or 'A'.

HYPOTHESIS

A scientific hypothesis is the initial building block in a science experiment. It is often described as an "educated guess," based on prior knowledge.

The basic idea of a hypothesis is that it has to be something that can be supported or refuted through experiments or observation.

INTRODUCTION / PURPOSE

Usually the introduction is one paragraph that explains the objectives or purpose of the lab experiment.

What is the report about without specific details?

- Describe the problem investigated.
- State main objectives. (What did you investigate? Why?)
- Summarize relevant research to provide context, key terms, and concepts so your reader can understand the experiment.

MATERIALS / EQUIPMENT

List everything needed to complete your experiment.

METHOD

Describe the steps you completed during your investigation. This is your procedure. Be sufficiently detailed that anyone could read this section and duplicate your experiment. Write it as if you were giving direction for someone else to do the lab. Order procedures chronologically. It may be helpful to provide a Figure to diagram your experimental setup.

DATA

Numerical data obtained from your procedure usually is presented as a table. Data encompasses what you recorded when you conducted the experiment. It's just the facts, not any interpretation of what they mean.

RESULTS / DISCUSSION

Describe in words what the data means. Sometimes the Results section is combined with the Discussion (Results & Discussion).

TIPS FOR REPORTING THE RESULTS:

- What did you observe?
- Order multiple results logically: from most to least important
from simple to complex
- Use past tense to describe 'what happened.'
- DON'T simply repeat the table data, select the important information.

TIPS FOR THE DISCUSSION:

- What do your observations mean?
- This is where you interpret the data and determine whether or not a hypothesis was accepted (or achieved)
- This is also where you would discuss any mistakes you might have made while conducting the investigation/experiment.
- You may wish to describe ways the experiment might have been improved.

CONCLUSION

Most of the time the conclusion is a single paragraph that sums up what happened in the experiment, whether your hypothesis was accepted (achieved) or rejected (failed) and what this means.

REFERENCES

If your research was based on someone else's work or if you cited facts that require documentation, then you should list these references.

SCIENTIFIC REPORT

TITLE

HYPOTHESIS

INTRODUCTION / PURPOSE

MATERIALS / EQUIPMENT

METHOD

DATA

RESULTS / DISCUSSION

CONCLUSION

REFERENCES

SUSTAINABLE URBAN ENVIRONMENT PROJECT ASSESSMENT RUBRIC

| | 1 MARK | 2 MARKS | 3 MARKS |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HYPOTHESISING | Does not use prior knowledge and understanding to explain possible impacts on the environment. The hypothesis made is not relevant. | Demonstrates some understanding to explain possible impacts on the environment. Has made a reasonable hypothesis. | Uses prior knowledge and understanding to explain possible impacts on the environment. Hypothesis shows clear understanding. |
| PLANNING | Is working towards developing knowledge and understanding of the process and methods of exploring, generating, testing and relating ideas to solve the problem. | Uses knowledge and understanding of the process and methods of exploring, generating, testing and relating ideas to solve the problem. | Uses knowledge and understanding of the process and methods of exploring, generating, testing and relating ideas to solve the problem. |
| ANALYSING | Cause and effect is not explained clearly. | Uses cause and effect relationship to explain the issue. Does not use evidence to show possible impact. | Uses cause and effect relationship to explain the issue. Uses evidence to show possible impact. |
| DRAWING CONCLUSIONS | Student has not gathered enough information and has little knowledge to help determine the best solution to the proposed development. | Student uses prior knowledge and has gathered some information to help determine the best solution to the proposed development. | Student uses knowledge and all gathered information, to determine the best solution to the proposed development. The solution reflects creating or maintaining a sustainable environment. |
| CONTENT | Few scientific terms are defined or used. Did not provide visual aid or experiment to show the results of human impact on the environment. Scientific report is completed briefly and lacks important information. | Uses and defines some scientific terminology. Has provided either one visual aid or experiment to show the results of human impact on the environment. Scientific report is completed to a satisfactory standard. | Uses and defines important scientific terminology. Provides quality visual aids / experiments to show the results of human impact on the environment. Scientific report is completed to a high standard. |
| COLLABORATIVE GROUP WORK | With teacher guidance, uses a limited number of strategies to work within the team to complete the task. | Identifies and uses some cooperative learning strategies to work efficiently as a team. | Demonstrates a high understanding of cooperative learning strategies and uses these to work collaboratively to complete the task successfully. |
| ORAL PRESENTATION | Holds no eye contact with audience, as entire report is read from notes. Speaks in low volume and/ or monotonous tone, which causes audience to disengage. Does not show much enthusiasm or knowledge about topic. | Consistent use of direct eye contact with audience, but still returns to notes. Speaks with satisfactory variation of volume and inflection. Shows some enthusiastic feelings about topic. Raises audience understanding and awareness of most points. | Holds attention of audience maintaining eye contact consistently. Uses variation of volume and inflection. Demonstrates strong enthusiasm about the topic during entire presentation. Significantly increases audience understanding and knowledge of topic. Convinces an audience to recognize the validity and importance of the subject. |

TOTAL

TEACHER COMMENTS
