	Port Augusta Secondary School – Mathematical Investigation		
	Task Title Letters and Numbers Investigation		
	Teacher	Year Level Year 8	Due Date



Task Description

‘Letters and Numbers’ is a quiz show that was shown on SBS that asks contestants to solve a range of problems that deal with order of operations problems and anagrams using random selections of letters or numbers. In this task the numbers game will be investigated. This game uses 6 random numbers, either large (25, 50, 75, 100) or small (1-10) to generate a randomly generated target number.

Instructions

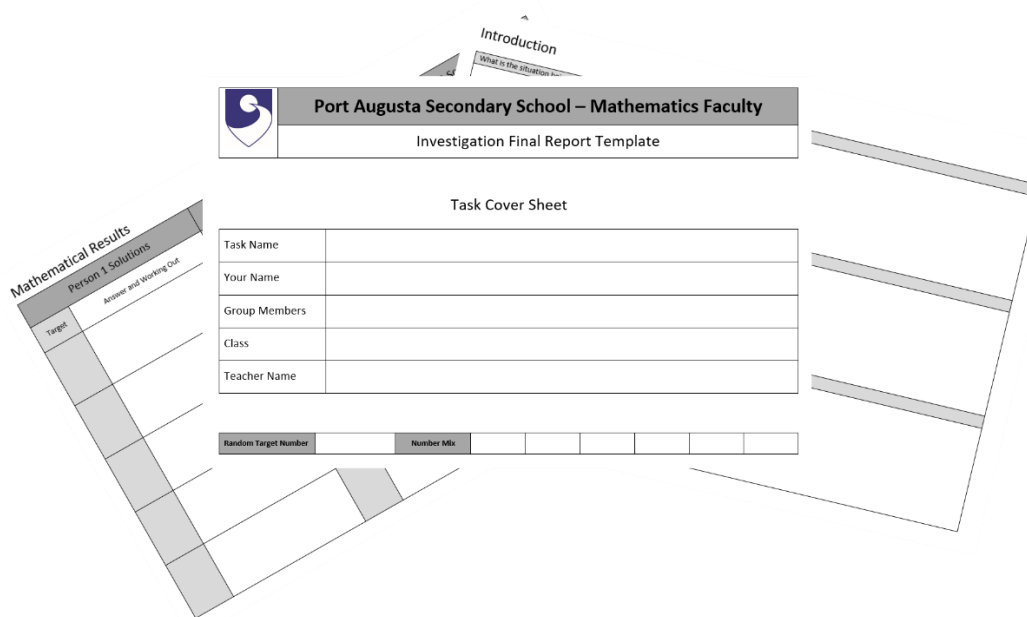
1. You can choose to work in groups of **no larger than 3** to complete this task
2. Choose the target range that you are aiming for as a group based on the following information.
 - **Level 1** – integers 50 to 200
 - **Level 2** – integers 400 to 550
 - **Level 3** – integers 750 to 900
3. See your teacher to generate a random target number in that range and make a note of this.
4. Once you have your target number decide on the mix of large and small numbers that your group wants from the choices below. See your teacher to get your number mix.
 - 6 small
 - 5 small and 1 large
 - 4 small and 2 large
 - 3 small and 3 large
 - 2 small and 4 large
5. Using each of your numbers at most once and any of the +, -, x, ÷, and () operations, generate 10 consecutive integers **for each member of your group** that must include the target number.

Your answers must be accurately documented in correct order of operations notation and must show how it would be worked out to get the suggested answer.

Examples

- If your target number is 550 and you are working by yourself you need to generate 10 consecutive integers that includes 550 (e.g 547 to 556).
- If your target number was 743 and you are working in a group of three you would need to generate 30 consecutive integers that includes 743 (e.g 740 to 769)

Report Structure



Your report can be completed on the template provided with this task.

- Remember to keep notes on what you are doing along the way you can do this on another of these templates or in your messy thinking book. Don't leave answering these questions until the end and try to remember what you did a few weeks ago.
- For your final report the responses in this template should be written in paragraph form.
- Each member of your group needs a completed template. Although what is written must be representative of the thinking of the group, you should not copy the responses from each other. Your responses should look different to others in the group.

Technical Vocabulary

The following words should be used accurately within the completion of the task. When you use them you should show that you clearly understand them.

order of operations

random

operations

consecutive

integer

target number(s)

Reflection

For each of the investigations that you complete this year you will be asked to reflect on the task that you completed both before submitting the task and also after receiving the feedback, this reflection will form an important part of the final grade for the work. This reflection is on a separate sheet that is included with this task.

Year 8 Maths Investigation Rubric

	Understanding	Fluency	Problem Solving	Reasoning	Structure	Language
A	<ul style="list-style-type: none"> <input type="checkbox"/> High level of understanding of mathematical concepts. <input type="checkbox"/> Able to make strong connections between related concepts <input type="checkbox"/> Able to adapt concepts to new contexts and ideas. 	<ul style="list-style-type: none"> <input type="checkbox"/> High level of skill in choosing appropriate procedures <input type="checkbox"/> High level of recall of factual knowledge. <input type="checkbox"/> Procedures were consistently used flexibly, accurately, efficiently and appropriately 	<ul style="list-style-type: none"> <input type="checkbox"/> Innovative or insightful strategy to solve the problem <input type="checkbox"/> All steps in process were justified, explained, well organized, detailed and articulated. <input type="checkbox"/> Large repertoire of problem solving strategies 	<ul style="list-style-type: none"> <input type="checkbox"/> High level of logical thought <input type="checkbox"/> Strong ability to analyze, prove, evaluate, infer, justify and generalize. 	<ul style="list-style-type: none"> <input type="checkbox"/> Strictly adheres to the required structure. All information set out well, easy to find and identify <input type="checkbox"/> Introduction clearly identifies the aim, what is being done and why. <input type="checkbox"/> Conclusion outlines what has been found and connects it to the aim 	<ul style="list-style-type: none"> <input type="checkbox"/> Personal language (e.g. me, I, we, us) is consistently and accurately removed from the text <input type="checkbox"/> All technical vocabulary is used effectively and accurately throughout the task
B	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds a C but is lower than an A 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds a C but is lower than an A 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds a C but is lower than an A 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds a C but is lower than an A 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds a C but is lower than an A 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds a C but is lower than an A
C	<ul style="list-style-type: none"> <input type="checkbox"/> Satisfactory level of understanding of mathematical concepts. <input type="checkbox"/> Sometimes able to make connections between related concepts <input type="checkbox"/> At times able to adapt these to new contexts and ideas. 	<ul style="list-style-type: none"> <input type="checkbox"/> Satisfactory level of skill in choosing appropriate procedures <input type="checkbox"/> Satisfactory ability to recall factual knowledge. <input type="checkbox"/> Carries out procedures flexibly, accurately, efficiently and appropriately with some general effectiveness 	<ul style="list-style-type: none"> <input type="checkbox"/> Effective strategy to solve the problem. <input type="checkbox"/> Mathematical thinking was appropriately documented however explanations lacked detail, articulation and/or organization <input type="checkbox"/> Evidence of a range of problem solving strategies. 	<ul style="list-style-type: none"> <input type="checkbox"/> Satisfactory level of logical thought <input type="checkbox"/> Some ability to analyze, prove, evaluate, infer, justify and/or generalize. 	<ul style="list-style-type: none"> <input type="checkbox"/> Mostly adheres to the required structure. Information generally set out effectively <input type="checkbox"/> Introduction clearly identifies the aim and what is being done but not why. <input type="checkbox"/> Conclusion outlines what has been found without connection to the aim. 	<ul style="list-style-type: none"> <input type="checkbox"/> Satisfactory attempt made to remove personal language (e.g. me, I, we, us) from the text <input type="checkbox"/> Technical vocabulary is included in the task with some degree of accuracy
D	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds an E but is lower than a C 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds an E but is lower than a C 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds an E but is lower than a C 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds an E but is lower than a C 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds an E but is lower than a C 	<ul style="list-style-type: none"> <input type="checkbox"/> Work exceeds an E but is lower than a C
E	<ul style="list-style-type: none"> <input type="checkbox"/> Little or no understanding of mathematical concepts. <input type="checkbox"/> Unable to make connections between related concepts <input type="checkbox"/> Unable to adapt these to new contexts or ideas. 	<ul style="list-style-type: none"> <input type="checkbox"/> Little or no skill in choosing appropriate procedures <input type="checkbox"/> Little or no ability to recall factual knowledge. <input type="checkbox"/> Not able to carry out procedures flexibly, accurately, efficiently or appropriately in most situations. 	<ul style="list-style-type: none"> <input type="checkbox"/> Ineffective and inappropriate strategy to solve the problem. <input type="checkbox"/> Mathematical thinking was not documented, or was only documented to a limited extent. 	<ul style="list-style-type: none"> <input type="checkbox"/> Little or no logical thought <input type="checkbox"/> Little or no ability to analyze, prove, evaluate, infer, justify and/or generalize. 	<ul style="list-style-type: none"> <input type="checkbox"/> Little or no structure. Information very hard to find <input type="checkbox"/> Little or no attempt to write an introduction <input type="checkbox"/> Little or no attempt to write a conclusion 	<ul style="list-style-type: none"> <input type="checkbox"/> Little or no attempt is made to remove personal language (e.g. me, I, we, us) from the text <input type="checkbox"/> Little or no attempt is made to incorporate any of the technical vocabulary into the task

Student Feedback