



# Research and Discovery Academy

Semester 2 2008

the best we can be

<b>Name:</b>		<b>Form Class:</b>	
<b>Subject:</b>	<b>Prep Maths A</b>	<b>Date Set:</b>	Week 4
<b>Teacher:</b>		<b>Draft Due Date:</b>	Week 5
<b>Semester:</b>	Term 3, Semester 2, 2009	<b>Final Due Date:</b>	Week 6
<b>Year:</b>	10		
<b>Assessment No</b>	4	<b>Assessment Technique</b>	Extended Writing Task
<b>Topic/s:</b>	<b>Data Collection and Presentation Chance - Probability</b>		

**Instructions & Conditions:**

- **Task should be typed and attractively displayed.**
- **Criteria sheet is to be included with assignment on submission.**
- An electronic copy may be located on the **curriculum drive** of the school network.
- Students should access the Blackboard on-line classroom for supportive material which could help in the completion of this assignment. **www.learningplace.eq.edu.au**
- **Read all questions carefully.** Full setting out must be used.
- **Two in-class tutorial lessons** will be allocated .
- Calculators and other technology such as **Excel spreadsheets** may be used.
- Any requests for extensions must be authorised by the HOD, Mr Thomson **PRIOR** to the due date.
- **DRAFT submissions are a vital** and required part of all assignment work.
- All due dates set, including draft due dates, are to be adhered to. Students are responsible for collecting draft feedback from teachers.
- **School assignment policy and procedures will be adhered to.** In the event of a non-submitted assignment, class time will be allocated at the earliest opportunity, for the student to undertake the assignment and submit at the end of that lesson.

Standard Achieved	Knowledge and Procedures	Modelling and Problem Solving	Communication and Justification	OVERALL

	<b>Part A</b>	<b>Percent %</b>
<b>KAPs</b>	<u>30</u>	

Name: \_\_\_\_\_

Outcome Level		JMA	4 E	4.5 D	5 C	5.6 B	6 A
<b>Knowledge and Procedures</b>			Have you attempted to...? <input type="checkbox"/> achieved <b>&lt;25%</b> in the three tasks chosen..	Have You...? <input type="checkbox"/> achieved <b>≥25%</b> in the three tasks chosen.	Have You...? <input type="checkbox"/> achieved <b>≥50%</b> in the three tasks chosen.	Have you...? <input type="checkbox"/> achieved <b>≥70%</b> in the three tasks chosen.	Have you...? <input type="checkbox"/> achieved <b>≥85%</b> in the three tasks chosen
<b>Modelling and Problem Solving</b>	<b>Throwing a six to start</b>		The response has been <b>attempted</b> , for example, by constructing a diagram or graph from the information given.	The response has been <b>attempted</b> , for example, by constructing a diagram or graph from the information given, but an <b>inappropriate path was chosen</b> which did not progress to a solution.	The response has <b>steps</b> that progress towards a solution. There may be a mechanical error or a logic error that resulted in the solution not being correct.	The response has <b>logical</b> steps that <b>substantially</b> progress towards a solution. It is mostly correct with few mechanical errors.	The response has all logical steps correct and few, if any, mechanical errors.
	<b>Hit or Sit</b>		The response has been <b>attempted</b> , for example, by constructing a diagram or graph from the information given.	The response has been <b>attempted</b> , for example, by constructing a diagram or graph from the information given, but an <b>inappropriate path was chosen</b> which did not progress to a solution.	The response has <b>steps</b> that progress towards a solution. There may be a mechanical error or a logic error that resulted in the solution not being correct.	The response has <b>logical</b> steps that <b>substantially</b> progress towards a solution. It is mostly correct with few mechanical errors.	The response has all logical steps correct and few, if any, mechanical errors.
	<b>Deal or No Deal</b>		The response has been <b>attempted</b> , for example, by constructing a diagram or graph from the information given.	The response has been <b>attempted</b> , for example, by constructing a diagram or graph from the information given, but an <b>inappropriate path was chosen</b> which did not progress to a solution.	The response has <b>steps</b> that progress towards a solution. There may be a mechanical error or a logic error that resulted in the solution not being correct.	The response has <b>logical</b> steps that <b>substantially</b> progress towards a solution. It is mostly correct with few mechanical errors.	The response has all logical steps correct and few, if any, mechanical errors.
<b>Communication and Justification</b>			Have only <b>rarely</b> shown...? <input type="checkbox"/> use of basic conventions of language or mathematical symbols	Have you <b>sometimes</b> shown...? <input type="checkbox"/> evidence of the use of basic conventions of language and mathematical symbols <input type="checkbox"/> maths which makes sense from one line to the next	Have you <b>generally</b> shown...? <input type="checkbox"/> accurate and appropriate use of mathematical terms, symbols and language <input type="checkbox"/> evidence (words, diagrams, symbols, etc) to support the processes used <input type="checkbox"/> maths which makes sense from one line to the next <input type="checkbox"/> use of <b>some</b> mathematical reasoning to develop <b>simple</b> logical arguments in support of propositions, results and/or conclusions <input type="checkbox"/> collection and organisation of information into an appropriate form of presentation suitable for a given use or audience	Have you <b>generally</b> shown...? <input type="checkbox"/> accurate and appropriate use of mathematical terms, symbols and language <input type="checkbox"/> evidence (words, diagrams, symbols, etc) to support the processes used <input type="checkbox"/> maths which makes sense from one line to the next <input type="checkbox"/> use of <b>mathematical</b> reasoning to develop <b>simple</b> logical arguments in support of propositions, results and/or conclusions <input type="checkbox"/> collection and organisation of information into an appropriate form of presentation suitable for a given use or audience <input type="checkbox"/> <b>justification of procedures</b>	Have you <b>consistently</b> shown...? <input type="checkbox"/> accurate and appropriate use of mathematical terms, symbols and language <input type="checkbox"/> evidence (words, diagrams, symbols, etc) to support processes used <input type="checkbox"/> maths which makes sense from one line to the next <input type="checkbox"/> use of mathematical reasoning to develop logical arguments in support of propositions, results and/or conclusions <input type="checkbox"/> collection and organisation of information into an appropriate form of presentation suitable for a given use or audience. <input type="checkbox"/> justification of procedures <input type="checkbox"/> <b>restatement of the question in own words to show assumed understanding of posed question.</b>

Comments: \_\_\_\_\_

## Part A – KAPS Data Collection and Display

1. The table below shows the height and mass of ten Year 10 students.

Height (cm)	120	124	130	135	142	148	160	164	170	175
Mass (kg)	45	50	54	60	59	65	70	78	75	80

- a) Choose, from the list below, the most appropriate graph to use to show the above data. Complete the appropriate graph (**MUST be completed by hand**). (4 marks)
- stem and leaf plot
  - pie chart
  - scatter plot

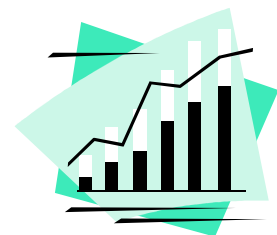


- b) Calculate the mean, median, mode and range for the **mass** of the Year 10 students. (4 marks)

2. Two classes of Year 10 students were surveyed about the amount of money spent on mobile phones in one specific month. The results were as follows:

	Class A							Class B						
48	50	67	24	39	100	140	77	49	84	73	59	66	90	
39	77	84	24	150	184	210	96	88	99	103	111	120	84	
49	88	89	84	86	94	99	88	90	90	102	100	89	137	
66	64	84	37	88	94	105	48	64	69	96	85	139	102	
121	143	94	85	81	42	111	114	84	96	82	104	86	91	

- a) Collate **each** data set into **grouped frequency distribution table**. (4 marks)
- b) **Create a back-to-back histogram** to compare the first class' data with the second class' data. (6 marks)
- c) Work out the **data measures** - median, lower and upper quartiles **for both sets** of data.  
Create a **dual box-and-whisker plot**. (8 marks)
- d) Explain any **TWO predictions or trends** you observe from the histogram. (2 marks)
- e) Explain any **TWO predictions or trends** you observe from the box and whisker plot and summary statistics. (2 marks)



## Part B – MAPS Probability

### Throwing a 6 to start



#### Task 1

*You will need:* one die, 5 friends.

Many people believe a 6 is the hardest number to roll when you roll a dice – (whenever you need one to start a game it seems to take forever to come up.)

**Task:** **Predict** which number on the die do you think is the hardest to roll? **Record** your prediction with your teacher.

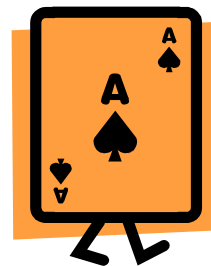
**To VALIDATE your answer:**

- a) Design a **frequency distribution table** for rolling a single die, (include a score x frequency column and a cumulative frequency column).
- b) **Roll the die 50 times** and record the data in your frequency distribution table.
- c) Work out the basic statistics including **the mean, median, mode and range** of your data.
- d) Answer the following questions:
  - I. Which number on the die came up the most often?
  - II. Which number came up the least often?
  - III. Was a 6 harder to throw than the other numbers? Explain
- e) Combine your results with at least **five (5) other class** members. (totals only)
  - I. Create a new frequency distribution table to show this data.
  - II. Analyse the data. Include a paragraph concerning any possible trends.
- f) Create a **cumulative frequency polygon** to show this data.
- g) How many 6s would you **expect** to come up if you threw the die:
  - I. 100 times
  - II. 300 times
  - III. 60 times

**Show all rules and working in each case.**



## Hit or sit?



### Task 2: PREDICT the probability of being dealt 'Blackjack'?

(Blackjack sometimes referred to as 21 is a card game which consists of being dealt an ace with either a king, queen, jack or ten. *Details of playing cards and black jack rules are available on your blackboard classroom.*)

To **support your prediction**, answer the following:

- Is the dealing of two cards, such as in Blackjack, an example of an independent or dependent event? **Explain why.**
- What is the probability** of being dealt an ace with the first card?
- If you have been dealt an ace with your first card, **what is the probability** that you will then be dealt a king, queen, jack or ten with your second card?
- You could also obtain 'Blackjack' if you were dealt the king, queen, jack or ten first followed by the ace. **Find the probability** of this occurring and hence the probability of obtaining 'Blackjack'.
- When the game of Blackjack is played in the casinos it is played with 5 packs of cards, completely shuffled. Calculate the probability of obtaining 'Blackjack' when 5 packs are used. How does this compare with the probability of one pack being used? **Explain in detail.**

**Task 3:** When an ace is dealt its value can be either a 1 or 11 depending on what the player's thinks it the best option to win.

You are dealt two cards and if you want a third card you say: "Hit me" to the dealer.

If you are happy with your two cards and think they are as close to 21 (blackjack) as you can get without busting then you say: "**SIT**" to the dealer.

When you "hit me" and get a third card you could easier **BUST** (go over a total of 21) – you automatically lose all your money.

- If you have two cards with a total of 11, **what is the probability that you will bust** if you hit for a third card in any one game of blackjack? Explain your answer.



## DEAL OR NO DEAL – What would you do?

**TASK 4:** Your friend is a contestant on **Deal NO Deal** – a popular game show and you are there as the friend sharing in the prize money.

She has chosen the number 26 and has already selected a number of cases which has placed her in the position as shown below.

- a) What advice would you give – Deal or No Deal? **JUSTIFY** your answer with full explanations of all elements to be considered.

