

EDF5032

Numeracy and Mathematics education in
the Primary years.

ASSESSMENT TASK 1

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PART A



Fig. 1.1

- The skill to instantly see how many in a group is called subitising (Reys, 2012, p.147).
- Group recognition mainly relates to classifying and making comparisons to develop number sense in children. These involve discrimination between important and irrelevant attributes as well as describe relationships such as more than, less or fewer than, and as many as (Reys, 2012, p.148).

PHOTOGRAPH/VIDEO 1:

This photograph was taken at a coffee shop. Also attached is a video consisting of stacked plates and paper cups, gathered bunch of sugar packets, straws, glass cups and a view of coffee beans in a coffee bean dispenser. I chose this photo to discuss and explore the mathematical concept of subitising to be able to build group recognition capabilities.

Discussion prompts for subitising can simply include questions such as determining the number of black and brown colour plates, cups, coffee beans, straws, etc. To be able to calculate the closest approximations builds the fluency expertise in children. In hand, questions related to noticing the differences and similarities among objects to classify them and then contrast numerical values could be – are all black plates of the same size? Are the smaller ones more than the bigger ones? Do they have more brown plates compared to black plates? Can we establish that there are equal number of green and blue sugar packets? Why is it that the smaller cups stacked in the front seem less in number compared to the bigger ones stacked on the top right? How would we know if we can fit all the coffee beans from the dispenser into the cups stacked in a pyramid at the back without actually doing it? Here, the child is encouraged to explain his/her thought processes and reason with the known as well as unknown facts.



Fig. 1.2

- To be able to describe 3-dimensional objects as well as explain geometric differences and similarities between two or more objects is called describing and sorting (Reys, 2012, p.377).

PHOTOGRAPH 2:

The second photograph is a tub filled with a variety of interesting shapes. It's part of an eight-year-old girl's playroom. I selected this particular one to help build describing and sorting skills.

How are these shapes alike or different? Can we separate them based on the sort of shape they resemble the most? – flower shaped pieces as circles, etc. The objects' base shapes are a 2D rectangle, square and circle. Although it can be concluded that they are not 3 dimensional, but representations of 2 dimensional shapes in solid objects, Reys argues that to progress from understanding 2D to 3D shapes, students need concepts from 2-dimensional shapes in order to more completely describe 3-dimensional objects (p.376). These novel and complex properties will enable the child to build distinguishing capabilities during the process and move from level 2 (children focus on the relationships between parts of a shape and defining attributes) towards level 3 thinking described by the van Hiele model, which is associated with development of abstract/ relational (level 3) thinking in geometry (Reys, 2012, p.377). It is linked with children's deeper understanding of concepts as they try to identify commonalities and differences between physical aspects of content.

PHOTOGRAPH 3:

The next photograph involves four children constructing objects from square and triangular blocks at a play date after school. I chose this to elaborate the properties of prisms and distinguish among different types with respect to its angles and physical features such as the relationships among the number of vertices, edges and faces of prisms, leading to an exploration associated with spatial reasoning as they seem to be sitting on their constructions of rectangular prisms as part of play.

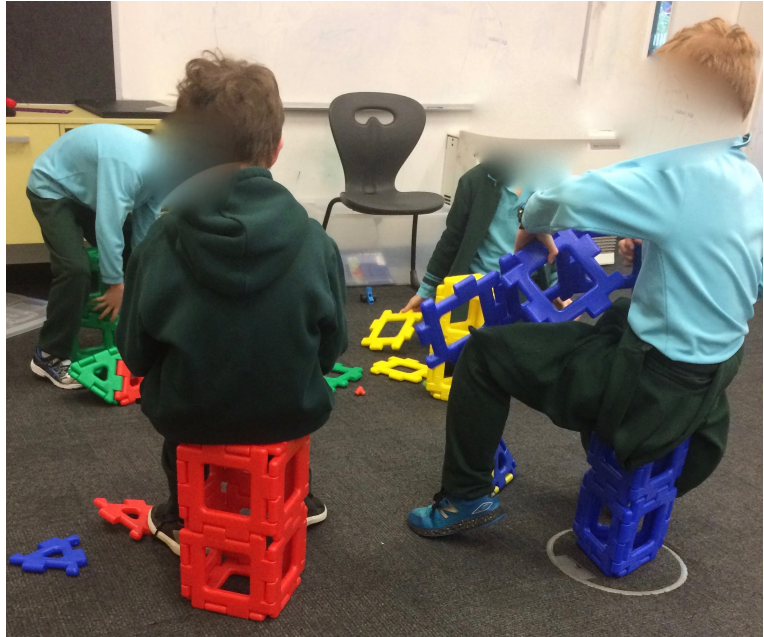


Fig. 1.3

- Battista (2007, pp.483, cited in Reys, 2012) defines spatial reasoning as the ability to see, inspect and reflect on spatial objects, images, relationships and transformations.
- Prisms are solids that have two equal and parallel bases joined by rectangular faces (Reys, 2012,

p.483). The type of prisms differ from the shape of its bases. If it is a triangle, then it is a triangular prism (in progress construction in the picture by the child on the extreme left side). There are two children sitting on prisms, which can be termed as square prisms or cuboids.

Firstly, to establish if it is a 'prism' – are the opposite faces and bases same? As their base shapes are equal squares and they are joined with rectangular faces, is it a prism or a cube? If it is not a cube, can we call it a prism? – these will promote fluency in recognising shapes by remembering definitions. Secondly, in order to develop reasoning capabilities, prompts specifying the angular properties such as – where can we find the vertex for this prism? What degree angles can we notice here? Is it the same for this

triangular prism? How many faces do they have? Can we sort them based on the number of faces? Identifying angles backed by describing the thought process behind the formulation of conclusions promotes mathematical understanding. Sound understanding of angles is also argued to help children recognise and then differentiate among shapes.

Parents could challenge them to construct something bigger, appropriate for an adult to sit. Probing questions - What will happen if I sit on it if stacked horizontally, in comparison with stacking it vertically? It might be easier for me if it is vertical because I am tall but will it bear my weight? Will the structure become more sturdy/ stable if you are able to layer it? If you do layer it, how many more pieces of what size will you need? If you do layer them, will you simply stack them on top of one another or place them in various configurations; laid down, upright, sideways and so on. In this context, children will need to develop and workout a variety of logical and mathematical relationships in an attempt to understand the physical problems they might encounter, hence, formulating concrete or physical ways of manipulating the blocks, thereby fostering problem-solving and reasoning (spatial) proficiencies.

PHOTOGRAPH 4:

The last one is an image of the latest stock market update on CNBC channel playing on television at home. Particularly, it illustrates the performance statistics of RBOB Gasoline for one week. It has been chosen to interpret and develop a sense of analysing data displayed in the form of a line graph.



Fig. 1.4

- A graph is a type of diagram that may be used to visually present or organise data (Reys, 2012, p. 436). A line graph is an effective method for showing trends over time. Points on the grid are used to represent continuous or uninterrupted data (Reys, 2012, p.441).
- Interpreting results or data sense is the ability to read and evaluate statistical information being presented.

Discussion questions – With respect to reading the data, did the company's share value rise beyond \$ 2.37 (million or billion)? When did the company experience a considerable drop? Was it over the weekend or on Tuesday? Next, in order to read between the data – is the company having a good week or are there too many fluctuations in their performance? These primarily promote understanding inter-contextual ideas for interpretation of mathematical information.

Lastly, to read beyond the data, discussion questions may include supposing the company did not lose value over the weekend. Would the situation in the following week be any different? An open-ended question like this demands the child to reason and gives him or her an opportunity to abstract essential information in order to persistently apply strategies to discern the data.

PART B

NUMERACY INQUIRY REPORT

Introduction:

This investigation is to establish the best companies to invest in the form of shares to gain high returns in the distant future.

Question:

To be precise, I have savings of \$5000 and I need to know the companies I should invest in to get a minimum return of \$20,000 after five years.

Procedure:

Step 1: Together with collecting tips and tricks for effective investment strategies from the internet, consult my father as he has investing experience for the past forty years.

Results:

- Distribute stake among a wide range of companies instead of investing all of them in one or two.
- Typical household names such as Woolworths and Myer might be highly successful companies right now but they do not have big growth opportunities. Look for under the radar companies that offer hefty dividend pay-outs with the potential for dramatic long-term share appreciation.

Step 2: Research and shortlist companies.

From the Australian Stock Exchange 200 list, I took the top 50 companies based on market capitalisation growth percentage in the past one year. In the table below, I was able to shortlist 12 companies that had a growth percentage of more than 30% over the past one year and a positive percentage increase in individual share price. However, this lead to losing companies with higher market capitalisation value. Hence, I decided to remove companies that had a market capitalisation value of less than 3 billion instead. But there were companies that had a considerably high growth rate in the last one year, which is why I decided to classify them into high, medium and low risk companies.

	A	B	C	D	E	F	G
						Above 30% growth over 1 year	
1	Company	Price	% Change	Market capitalisation	1 year		% Increase
2	The a2 Milk Company	\$5.08	-3.79%	\$3,648,649,380	150.25%	Y	N
3	Costa Group Holdings	\$5.44	0.74%	\$1,736,885,577	94.98%	Y	Y
4	Whitehaven Coal	\$3.50	1.45%	\$3,591,160,598	90.22%	Y	Y
5	Monadelphous Group	\$15.18	-0.59%	\$1,425,831,048	70.56%	Y	N
6	Qantas Airways	\$5.68	-5.65%	\$10,270,725,821	69.05%	Y	N
7	Worleyparsons Ltd	\$13.39	-0.08%	\$3,308,324,141	68.01%	Y	N
8	Sims Metal MGMT Ltd	\$15.35	4.07%	\$3,052,146,615	61.07%	Y	Y
9	Seven Group Holdings	\$12.93	0%	\$3,636,444,449	59.43%	Y	Y
10	Alumina Ltd	\$2.12	-1.40%	\$6,105,268,216	54.74%	Y	N
11	Downer Edl Ltd	\$6.87	0.29%	\$4,085,606,257	45.94%	Y	Y
12	SOUTH32 Ltd	\$2.88	1.05%	\$15,027,609,277	43.28%	Y	Y
13	Als Ltd	\$7.86	-1.01%	\$3,963,178,184	42.13%	Y	N
14	Nine Entertainment	\$1.46	-2.99%	\$1,272,204,859	41.75%	Y	N
15	Iluka Resources	\$9.67	0.21%	\$4,048,833,999	40.55%	Y	Y
16	Origin Energy	\$7.60	0.13%	\$13,341,423,960	39.19%	Y	Y
17	Breville Group Ltd	\$10.96	-0.73%	\$1,425,844,729	38.91%	Y	N
18	Computershare Ltd	\$13.75	-0.87%	\$7,511,982,638	38.61%	Y	N
19	Orica Ltd	\$20.35	0.15%	\$7,672,744,199	37.59%	Y	Y
20	Challenger Ltd	\$12.45	-1.97%	\$7,121,423,095	36.96%	Y	N
21	Flight Centre Travel	\$49.47	0.82%	\$4,998,988,716	36.54%	Y	Y
22	Cimic Group Ltd	\$42.02	-1.15%	\$13,625,157,156	35.59%	Y	N
23	RIO Tinto Ltd	\$66.50	-1.23%	\$28,208,795,398	35.44%	Y	N
24	Aristocrat Leisure	\$21.13	1.00%	\$13,492,437,890	34.67%	Y	Y
25	Mineral Resources	\$14.83	-1.13%	\$2,778,106,807	34.21%	Y	N
26	Cleanaway Waste Ltd	\$1.435	0.70%	\$2,286,999,313	31.65%	Y	Y
27	Corp Travel Ltd	\$21.15	0.67%	\$2,238,132,085	29.06%	N	Y
28	Mcmillan Shakespeare	\$15.62	-0.38%	\$1,299,657,726	28.14%	N	N
29	BHP Billiton Ltd	\$26.89	0.79%	\$86,362,373,813	27.86%	N	Y
30	Treasury Wine Estate	\$14.14	1.29%	\$10,437,229,367	25.24%	N	Y
31	AGL Energy Ltd	\$23.30	-0.98%	\$15,280,723,502	24.27%	N	N
32	Bank of Queensland	\$12.73	0.39%	\$4,986,846,750	23.35%	N	Y
33	Bluescope Steel Ltd	\$10.98	-2.66%	\$6,161,003,545	22.82%	N	N
34	Beach Energy Ltd	\$0.675	-4.26%	\$1,264,823,427	22.73%	N	N
35	OZ Minerals	\$8.18	-3.77%	\$2,443,077,655	22.46%	N	N
36	Metcash Ltd	\$2.68	0.38%	\$2,614,720,228	22.37%	N	Y
37	Fortescue Metals Group	\$5.90	-1.67%	\$18,371,409,091	22.15%	N	N
38	IOOF Holdings Ltd	\$10.87	-0.55%	\$3,262,453,884	21.05%	N	N
39	Northern Star	\$5.01	-0.99%	\$3,021,891,565	20.43%	N	N
40	G.U.D. Holdings	\$11.70	-2.26%	\$1,008,372,667	20.00%	N	N
41	G8 Education Ltd	\$3.89	0%	\$1,733,722,080	19.69%	N	Y
42	Incitec Pivot	\$3.33	-1.77%	\$5,618,277,835	18.93%	N	N
43	Steadfast Group Ltd	\$2.59	0%	\$1,941,856,732	17.73%	N	Y
44	Webjet Ltd	\$11.16	2.20%	\$1,210,500,313	17.31%	N	Y
45	CSL Ltd	\$128.20	-0.27%	\$58,008,012,151	17.17%	N	N
46	Abacus Property Group Units/ Stapled Securities	\$3.56	-0.28%	\$2,049,030,510	17.11%	N	N
47	Lendlease Group Unit/ Stapled Securities	\$16.55	0.61%	\$9,656,421,185	16.71%	N	Y
48	BT Investment MNGMNT	\$10.71	-0.56%	\$3,373,636,752	15.29%	N	N
49	Reliance Worldwide	\$3.66	8.93%	\$1,921,500,000	14.38%	N	Y
50	Perpetual Ltd	\$55.77	1.83%	\$2,597,455,738	14.21%	N	Y

Fig. 2.1

Step 3: Classify companies based on their past performance into high risk, medium risk and low risk. In order to do this, I had to carefully set approximate ranges and limits, taking into consideration the overall valuation. The aforementioned suggestion in the previous step was applied during this process.

	A	B	C	D	E	F	G	H	I
						HIGH - \$1 to 10 million & <50% OR MC value \$50 million +	MEDIUM - \$1 million + & <40% OR \$10 million + & >20%MC	LOW - \$10 to 50 million & <30%	DELETE - \$1 to 10 & >40% MC
2	Company	Price	% Change	Market capitalisation	1 year				
3	The a2 Milk Company	\$5.08	-3.79%	\$3,648,649,380	150.25%	Y			
4	Costa Group Holdings	\$5.44	0.74%	\$1,736,885,577	94.98%	Y			
5	Whitehaven Coal	\$3.50	1.45%	\$3,591,160,598	90.22%	Y			
6	Monadelphous Group	\$15.18	-0.59%	\$1,425,831,048	70.56%	Y			
7	Qantas Airways	\$5.68	-5.65%	\$10,270,725,821	69.05%			Y	
8	Worleyparsons Ltd	\$13.39	-0.08%	\$3,308,324,141	68.01%	Y			
9	Sims Metal MGMT Ltd	\$15.35	4.07%	\$3,052,146,615	61.07%	Y			
10	Seven Group Holdings	\$12.93	0	\$3,636,444,449	59.43%	Y			
11	Alumina Ltd	\$2.12	-1.40%	\$8,105,268,216	54.74%	Y			
12	Downer Edl Ltd	\$6.87	0.29%	\$4,085,606,257	45.94%		Y		
13	SOUTH32 Ltd	\$2.88	1.05%	\$15,027,609,277	43.28%			Y	
14	Als Ltd	\$7.86	-1.01%	\$3,963,178,184	42.13%		Y		
15	Nine Entertainment	\$1.46	-2.99%	\$1,272,204,859	41.75%		Y		
16	Iuka Resources	\$9.67	0.21%	\$4,048,833,999	40.55%		Y		
17	Origin Energy	\$7.60	0.13%	\$13,341,423,960	39.19%			Y	
18	Breville Group Ltd	\$10.96	-0.73%	\$1,425,844,729	38.91%				Y
19	Computershare Ltd	\$13.75	-0.87%	\$7,511,982,638	38.61%				Y
20	Orica Ltd	\$20.35	0.15%	\$7,672,744,199	37.59%				Y
21	Challenger Ltd	\$12.45	-1.97%	\$7,121,423,095	36.96%				Y
22	Flight Centre Travel	\$49.47	0.82%	\$4,998,988,716	36.54%				Y
23	Cimic Group Ltd	\$42.02	-1.15%	\$13,625,157,156	35.59%			Y	
24	RIO Tinto Ltd	\$66.50	-1.23%	\$28,208,795,398	35.44%			Y	
25	Aristocrat Leisure	\$21.13	1.00%	\$13,492,437,890	34.67%			Y	
26	Mineral Resources	\$14.83	-1.13%	\$2,778,106,807	34.21%				Y
27	Cleanaway Waste Ltd	\$1.435	0.70%	\$2,286,999,313	31.65%				Y
28	Corp Travel Ltd	\$21.15	0.67%	\$2,238,132,085	29.06%				Y
29	McMillan Shakespeare	\$15.62	-0.38%	\$1,299,657,726	28.14%				Y
30	BHP Billiton Ltd	\$26.89	0.79%	\$86,362,373,813	27.86%	Y			
31	Treasury Wine Estate	\$14.14	1.29%	\$10,437,229,367	25.24%		Y		
32	AGL Energy Ltd	\$23.30	-0.98%	\$15,280,723,502	24.27%		Y		
33	Bank of Queensland	\$12.73	0.39%	\$4,986,846,750	23.35%				Y
34	Bluescope Steel Ltd	\$10.98	-2.66%	\$6,161,003,545	22.82%				Y
35	Beach Energy Ltd	\$0.675	-4.26%	\$1,264,823,427	22.73%				Y
36	OZ Minerals	\$8.18	-3.77%	\$2,443,077,655	22.46%				Y
37	Metcash Ltd	\$2.68	0.38%	\$2,614,720,228	22.37%				Y
38	Fortescue Metals Group	\$5.90	-1.67%	\$18,371,409,091	22.15%		Y		
39	IOOF Holdings Ltd	\$10.87	-0.55%	\$3,262,453,884	21.05%				Y
40	Northern Star	\$5.01	-0.99%	\$3,021,891,565	20.43%				Y
41	G.U.D. Holdings	\$11.70	-2.28%	\$1,008,372,667	20.00%				Y
42	G8 Education Ltd	\$3.89	0	\$1,733,722,080	19.69%				Y
43	Incitec Pivot	\$3.33	-1.77%	\$5,618,277,835	18.93%				Y
44	Steadfast Group Ltd	\$2.59	0	\$1,941,856,732	17.73%				Y
45	Webjet Ltd	\$11.16	2.20%	\$1,210,500,313	17.31%				Y
46	CSL Ltd	\$128.20	-0.27%	\$58,008,012,151	17.17%	Y			
47	Abacus Property Group Units/ Stapled Securities	\$3.56	-0.28%	\$2,049,030,510	17.11%				Y
48	Lendlease Group Unit/ Stapled Securities	\$16.55	0.61%	\$9,656,421,185	16.71%				Y
49	BT Investment MNGMNT	\$10.71	-0.56%	\$3,373,636,752	15.29%				Y
50	Reliance Worldwide	\$3.66	8.93%	\$1,921,500,000	14.38%				Y
51	Perpetual Ltd	\$55.77	1.83%	\$2,597,455,738	14.21%				Y
52				\$1- 3 million					
53				\$3- 5 million					
54				\$5- 10 million					
55				\$10- 50 million					
56				\$50 million +					
57									

Fig. 2.2

Further shortlisting was done to narrow down the count to the best companies to invest that might be highly risky but show impressive growth in the past years. Additionally, low risk companies that will guarantee returns as well as medium risk companies that have a promising average growth rate.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
										High growth (<100%) - high risk	High growth (<100%) - low risk	High growth (<100%) - medium risk	Low growth(0- 60%) - low risk	Low growth (0-60%) - high risk	Low growth (0-60%) - medium risk	Medium growth (61- 100%) - high risk	Medium growth (61- 100%) - low risk	Medium growth (61- 100%) - medium risk
1	Company	Price	% Change	Market capitalisa/ 1 year	01/08/15	28/07/17	Difference	% Increase- 2 years										
2	The a2 Milk Company	\$5.08	-3.79%	\$3,648,649,380	150.25%	0.64	5.08	4.44	693.75	Y								
3	Fortescue Metals Group	\$5.90	-1.67%	\$18,371,409,091	22.15%	1.91	5.9	3.99	208.9005236			Y						
4	Whitehaven Coal	\$3.50	1.45%	\$3,591,160,598	90.22%	1.165	3.5	2.335	200.4291845	Y								
5	Seven Group Holdings	\$12.93	0	\$3,636,444,449	59.43%	4.96	12.93	7.97	160.6854839	Y								
6	Aristocrat Leisure	\$21.13	1.00%	\$13,492,437,890	34.67%	8.44	21.13	12.69	150.3554502		Y							
7	Treasury Wine Estate	\$14.14	1.29%	\$10,437,229,367	25.24%	5.86	14.14	8.28	141.2969283			Y						
8	Costa Group Holdings	\$5.44	0.74%	\$1,736,885,577	94.98%	2.29	5.44	3.15	137.5545852	Y								
9	Monadelphous Group	\$15.18	-0.59%	\$1,425,831,048	70.56%	7.51	15.18	7.67	102.1304927	Y								
10	Downer Edl Ltd	\$6.87	0.29%	\$4,085,606,257	45.94%	3.42	6.87	3.45	100.877193			Y						
11	SOUTH32 Ltd	\$2.88	1.05%	\$15,027,609,277	43.28%	1.52	2.88	1.36	89.47368421								Y	
12	Cimic Group Ltd	\$42.02	-1.15%	\$13,625,157,156	35.59%	23.41	42.02	18.61	79.49594191								Y	
13	Worleyparsons Ltd	\$13.39	-0.08%	\$3,308,324,141	68.01%	7.51	13.39	5.88	78.29560586							Y		
14	Qantas Airways	\$5.68	-5.65%	\$10,270,725,821	69.05%	3.37	5.68	2.31	68.54599407								Y	
15	Alumina Ltd	\$2.12	-1.40%	\$6,105,288,216	54.74%	1.31	2.12	0.81	61.83206107									
16	Als Ltd	\$7.86	-1.01%	\$3,963,178,184	42.13%	4.964	7.86	2.896	58.34004835						Y			
17	CSL Ltd	\$128.20	-0.27%	\$58,008,012,151	17.17%	91.87	128.2	36.33	39.54500925					Y				
18	AGL Energy Ltd	\$23.30	-0.98%	\$15,280,723,502	24.27%	16.89	23.3	6.41	37.95145056						Y			
19	Sims Metal MGMT Ltd	\$15.35	4.07%	\$3,052,146,615	61.07%	11.48	15.35	3.87	33.71080139					Y				
20	RIO Tinto Ltd	\$66.50	-1.23%	\$28,208,795,398	35.44%	50.29	66.5	16.21	32.23304832				Y					
21	Iluka Resources	\$9.67	0.21%	\$4,048,833,999	40.55%	7.43	9.67	2.24	30.14804845						Y			
22	Nine Entertainment	\$1.46	-2.99%	\$1,272,204,899	41.75%	1.46	1.66	0.2	13.69863014						Y			
23	BHP Billiton Ltd	\$26.89	0.79%	\$86,362,373,813	27.86%	25.18	26.89	1.71	6.791104051					Y				
24	Origin Energy	\$7.60	0.13%	\$13,341,423,960	39.19%	7.226	7.6	0.374	5.175754221				Y					

Fig. 2.3

Step 4: Finalise companies to make investments. Below is the percentage distribution of the amount to be invested.

	A	B	C	D	E	F	G	H	I	J	K	L	M
										High growth (<100%) - high risk	High growth (<100%) - low risk	High growth (<100%) - medium risk	Medium growth (61- 100%) - low risk
1	Company	Price	% Change	Market capitalisation 1 year	01/08/15	28/07/17	Difference	% Increase- 2 years					
2	The a2 Milk Company	\$5.08	-3.79%	\$3,648,649,380	150.25%	0.64	5.08	4.44	693.75	Y			
3	Fortescue Metals Group	\$5.90	-1.67%	\$18,371,409,091	22.15%	1.91	5.9	3.99	208.9005236			Y	
4	Whitehaven Coal	\$3.50	1.45%	\$3,591,160,598	90.22%	1.165	3.5	2.335	200.4291845	Y			
5	Seven Group Holdings	\$12.93	0	\$3,636,444,449	59.43%	4.96	12.93	7.97	160.6854839	Y			
6	Aristocrat Leisure	\$21.13	1.00%	\$13,492,437,890	34.67%	8.44	21.13	12.69	150.3554502		Y		
7	Treasury Wine Estate	\$14.14	1.29%	\$10,437,229,367	25.24%	5.86	14.14	8.28	141.2969283			Y	
8	Costa Group Holdings	\$5.44	0.74%	\$1,736,885,577	94.98%	2.29	5.44	3.15	137.5545852	Y			
9	Monadelphous Group	\$15.18	-0.59%	\$1,425,831,048	70.56%	7.51	15.18	7.67	102.1304927	Y			
10	Downer Edl Ltd	\$6.87	0.29%	\$4,085,606,257	45.94%	3.42	6.87	3.45	100.877193			Y	
11	SOUTH32 Ltd	\$2.88	1.05%	\$15,027,609,277	43.28%	1.52	2.88	1.36	89.47368421				Y
12	Cimic Group Ltd	\$42.02	-1.15%	\$13,625,157,156	35.59%	23.41	42.02	18.61	79.49594191				Y
13	Worleyparsons Ltd	\$13.39	-0.08%	\$3,308,324,141	68.01%	7.51	13.39	5.88	78.29560586				Y
14	Qantas Airways	\$5.68	-5.65%	\$10,270,725,821	69.05%	3.37	5.68	2.31	68.54599407				Y
15										20%		60%	20%

Fig. 2.4

Step 5: Calculate exact number of shares to be bought in relation to the percentage amount distribution. In the end, to determine the return on investment after five years, Compound Average growth rate (CAGR) was calculated after which the same formula was used to find out the stock's ending value in the future. The CAGR is the mean annual growth rate of an investment over a period of time longer than one year. As argued on a

website named Investopedia, it is not a true return rate, but rather a representational figure. It is essentially an imaginary number that describes the rate at which an investment would have grown if it had grown at a steady rate, which virtually never happens in reality. We can think of CAGR as a way to smooth out an investment's returns so that they may be more easily understood. The formula is –

$$\text{CAGR} = (\text{Ending value} / \text{Beginning value}) ^ { (1/n) } - 1$$

16										
17	Company	Price(\$)	Number of shares to buy	Total price of shares purchased now	Price(\$) September 2012	Total stock value in the past	Compound Average growth rate	Total stock value in the future		
18	Fortescue Metals Group	5.9	127.118644	\$750	3.49	443.644068	11.07%	1253.54		
19	Aristocrat Leisure	21.13	35.4945575	\$750	2.69	95.4803597	51.02%	5887.7		
20	Treasury Wine Estate	14.14	53.0410184	\$750	4.94	262.022631	23.41%	2145.5		
21	Downer Edl Ltd	6.87	109.170306	\$750	3.39	370.087336	15.17%	1518.73		
22	The a2 Milk Company	5.08	39.3700787	\$200	0.64	25.1968504	181.77%	1587	3967	
23	Whitehaven Coal	3.5	57.1428571	\$200	2.87	164	4.05%	243		
24	Seven Group Holdings	12.93	15.4679041	\$200	6.81	105.336427	13.68%	374.84		
25	Costa Group Holdings	5.44	36.7647059	\$200	2.29	84.1911765	54.13%	474.17	1185	
26	Monadelphous Group	15.18	13.1752306	\$200	19.7	259.552042	-5.08%	153.31		
27	SOUTH32 Ltd	2.88	115.625	\$333	1.365	157.828125	45.26%	700.13	1750	
28	Cimic Group Ltd	42.02	7.92479772	\$333	16.5	130.759162	20.56%	828.61		
29	Qantas Airways	5.68	58.6267606	\$333	1.22	71.5246479	36.02%	1549.3		
30										20,855
31										

Fig. 2.5

Implications:

In figure 2.5, total value of the stock in the future is predicted. The a2 Milk company, Costa group holdings and South 32 Ltd were established less than five years ago. Therefore, their CAGR was calculated over two years and then over five years through multiplication. The total return value including amount invested would be \$20,855 with a profit of \$15, 855. Monadelphous group is predicted to have a negative growth, so, the same money should be invested in something more promising such as the a2 milk company. Its capacity to grow is commendable and it might just not be a risk because milk is a necessary commodity, nevertheless, generally, recently established companies do really well in the first few years in my father's opinion. Hence, it is always safe to invest in safer businesses.

The enquiry report allowed me to investigate, interpret and analyse graphs from real data in addition to identifying and investigating issues involving numerical data (ACARA, 2016). Percentages of quantities were determined and average increase or decrease

was calculated. The elimination process required me to estimate and approximate values.

In relation to the proficiency strands, understanding whole numbers, percentages, growth rates, market value increase/ decrease percentages were required to calculate answers efficiently. The understanding proficiency along with fluency also helped me make connections and appropriately interpret data followed by choosing relevant methods and approximations to formulate conclusions. The high growth-low risk type column ranges were challenging to establish as they needed to be reasonable enough to involve companies whose numbers did not reflect actual growth. Errors were corrected in the process of discovering the correct method. Unsuccessful attempts made me reassess my thinking and begin again. Through such exploratory means I had to apply several problem-solving techniques, recall prior experiences and ask for assistance to reach the end goal.

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