



Freedom To Create. Spirit To Achieve.

Grade Three

Mathematics

*Provincial Achievement Test
(2007 Program of Studies)*

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English Language Arts and Mathematics*

Government of Alberta 

Education

Overview of Session

- ✓ How is the data from the Provincial Achievement Tests (PATs) used?
- ✓ How does information from the PATs help to improve classroom instruction and assessment?
- ✓ What can I do to ensure my students are ready for the PAT?
- ✓ How is the Mathematics Achievement Test designed?
- ✓ Are there any support materials out there?
- ✓ How can I get involved in the provincial achievement test development process?



Balanced Assessment

A balanced assessment approach is an integration of classroom assessments, jurisdictional assessments, and provincial assessments into a unified process that benefits instruction and student learning. (Rick Stiggins, 2008)



How is the data from the Provincial Achievement Tests used?



How is data from the PATs used?

- **Information for students and their parents:**

- ✓ feedback on how well the students have understood the learning objectives from the Alberta curriculum.

How is this feedback provided?

- ✓ Individual Student Profiles(ISPs).
- ✓ One copy is placed in each student's cumulative file and one copy of the ISP is sent to each student's parent(s).

PAT information video for parents:

<http://education.alberta.ca/parents/resources/exams.aspx>

Student Name:
 Alberta Student Number:
 School of Writing:
 School Authority:

Grade 6 Achievement Tests - June 2011 Individual Student Profile

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School Copy

Subject	Component	Student's Results		Range of Scores Within Each Standard ¹	
		Score	Standard Achieved	Acceptable Standard	Standard of Excellence
English Language Arts	Total Test ²	79/100	Excellence	47-76	77-100
	Reading	49/50	Excellence	21-36	37-50
	Writing	33/55	Acceptable	28-43	44-55
Mathematics	Total Test ³	48/50	Excellence	23-41	42-50
Social Studies	Total Test ³	50/50	Excellence	27-42	43-50
Science	Total Test	46/50	Excellence	25-40	41-50
	Knowledge	19/20	Excellence	9-15	16-20
	Skills	27/30	Excellence	16-24	25-30

The table above provides the student's scores for each subject and for the components of that subject. Also included is the range of scores that define each standard.

- ¹ These standards reflect provincial expectations.
- ² Reading and Writing reporting categories are weighted equally in the calculation of the total score for English Language Arts and French Language Arts.
- ³ Provincial standards are only set on the total test.

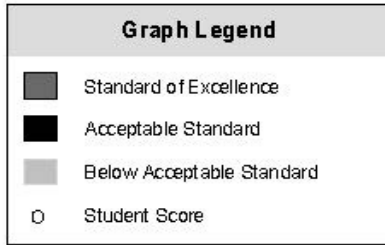
Additional information regarding the results of your school and school authority, as well as provincial results, are available on our web site at <http://education.alberta.ca/admin/testing.aspx>.

For further explanation of Achievement Test results, contact Ken Marcellus, Director - Achievement Testing Program (e-mail at: Ken.Marcellus@gov.ab.ca), Learner Assessment or call 780-427-0010 or toll free at 310-0000.

Student Name:
 Alberta Student Number:
 School of Writing:
 School Authority:

Grade 6 Achievement Tests - June 2011 Individual Student Profile

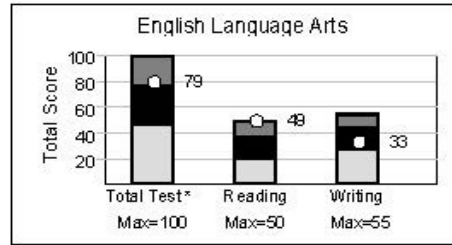
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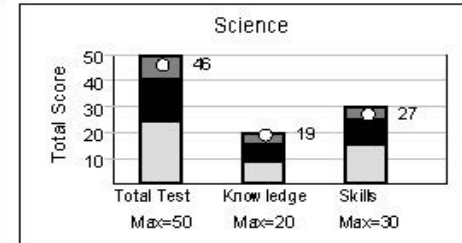
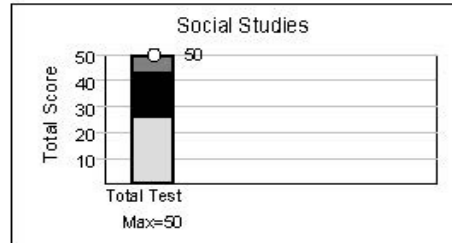
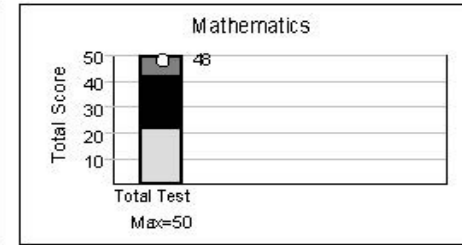
Explanatory Notes

The point on each bar graph indicates the score obtained by the student on the total test and on each of the two components of the test.

The shaded regions indicate the range of scores at the Standard of Excellence (dark grey region), the Acceptable Standard (black region), and below the acceptable standard (light grey region).



* Reading and Writing are weighted equally in the calculation of the total score.



How is data from the PATs used?

- **Information for teachers :**
 - ✓ provides information on how well their students have achieved in relation to the curriculum.
 - ✓ permits comparison of their assessment information to these test results.
 - ✓ provides some feedback on the effectiveness of their teaching methods.

How is data from the PATs used?

- **Information for principals :**
 - ✓ information on school achievement patterns in relation to provincial results.
 - ✓ information on achievement for reporting the school's annual results.
 - ✓ information to assist with program planning and future goal setting.

How is data from the PATs used?

- **Information for Superintendents/trustees:**
 - ✓ information regarding jurisdiction results in relation to their achievement targets (the percentage of students they expect to achieve acceptable and excellent standards).
 - ✓ provincial results for the jurisdiction 3 year education plan.

How is data from the PATs used?

- **Information for Alberta Education and Government:**
 - ✓ information for monitoring student learning of selected curricular knowledge and skills in relation to provincial targets (business plan).
 - ✓ to identify areas for improvement through curriculum redesign or program initiatives.
 - ✓ part of the Accountability Pillar report.

ACCOUNTABILITY PILLAR REPORT FOR 2010-2011

Accountability Pillar Overall Summary Annual Education Results Reports - Oct 2011 Province: Alberta

Government
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Education

Measure Category	Measure Category Evaluation	Measure	Alberta			Measure Evaluation		
			Current Result	Prev Year Result	Prev 3 yr Average	Achievement	Improvement	Overall
Safe and Caring Schools	Excellent	Safe and Caring	88.1	87.6	86.6	Very High	Improved Significantly	Excellent
Student Learning Opportunities	Good	Program of Studies	80.9	80.5	80.1	High	Improved Significantly	Good
		Education Quality	89.4	89.2	88.9	High	Improved Significantly	Good
		Drop Out Rate	4.2	4.3	4.7	High	Improved Significantly	Good
		High School Completion Rate (3 yr)	72.6	71.5	71.1	Intermediate	Improved Significantly	Good
Student Learning Achievement (Grades K-9)	Good	PAT: Acceptable	79.3	79.1	78.0	Intermediate	Improved Significantly	Good
		PAT: Excellence	19.6	19.4	18.5	High	Improved Significantly	Good
Student Learning Achievement (Grades 10-12)	Acceptable	Diploma: Acceptable	82.6	83.4	84.0	Low	Declined Significantly	Concern
		Diploma: Excellence	18.7	19.0	18.9	Intermediate	Maintained	Acceptable
		Diploma Exam Participation Rate (4+ Exams)	54.9	53.5	53.5	Intermediate	Improved Significantly	Good
		Rutherford Scholarship Eligibility Rate (Revised)	59.6	56.9	57.0	High	Improved Significantly	Good
Preparation for Lifelong Learning, World of Work, Citizenship	Good	Transition Rate (6 yr)	59.3	59.8	59.3	High	Maintained	Good
		Work Preparation	80.1	79.9	79.8	High	Improved	Good
		Citizenship	81.9	81.4	79.9	Very High	Improved Significantly	Excellent
Parental Involvement	Good	Parental Involvement	79.9	80.0	79.4	High	Improved	Good
Continuous Improvement	Good	School Improvement	80.1	79.9	78.8	High	Improved Significantly	Good

Notes:

- 1) PAT results are a weighted average of the percent meeting standards (Acceptable, Excellence) on Provincial Achievement Tests. The weights are the number of students enrolled in each course. Courses included: English Language Arts (Grades 3, 6, 9), Science (Grades 6, 9), French Language Arts (Grades 6, 9), Français (Grades 6, 9).
- 2) Diploma results are a weighted average of percent meeting standards (Acceptable, Excellence) on Diploma Examinations. The weights are the number of students writing the Diploma Examination for each course. Courses included: English Language Arts 30-1, English Language Arts 30-2, French Language Arts 30-1, Français 30-1, Pure Mathematics 30, Applied Mathematics 30, Biology 30, Science 30.
- 3) Overall evaluations can only be calculated if both improvement and achievement evaluations are available.
- 4) Results for the ACOL measures are available in the detailed report, see "ACOL Measures" in the Table of Contents.
- 5) Data values have been suppressed where the number of students is less than 6. Suppression is marked with an asterisk (*).

Transparency is Essential to Improvement

“...there is no way that continuous improvement can occur without constant transparency fueled by good data.”

Michael Fullan



The 2011 Grade 3 Mathematics Achievement Test

How many students wrote the test?

- 35 764 wrote the English form
- 3 612 wrote the French form
- Total number of Students: 39 376

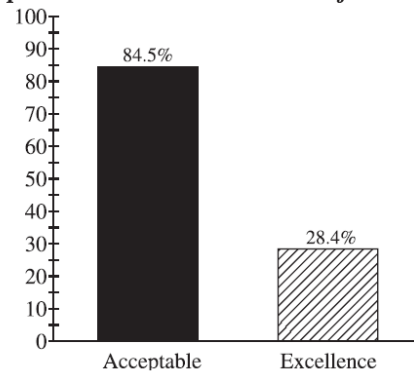
The 2011 Grade 3 Mathematics Achievement Test

How well did the students do on the tests?

- Provincial average: 28.9/40 (72.3%)
- Cut scores: 21/40 for Acceptable, 35/40 for Excellence

Grade 3—2011 Mathematics Achievement Test		
	Acceptable (%)	Excellence (%)
2011	84.5	28.4

Percentage of Students Meeting the
Acceptable Standard & Standard of Excellence (%)



2011 PAT Blueprint and Student Achievement

Description	Level of Complexity*			Provincial Student Achievement (Raw Score and Percentage)
	Low	Moderate	High	
Number <ul style="list-style-type: none"> Develop and demonstrate number sense for whole numbers 0 to 1 000, and understand fractions as part of a whole. Develop and demonstrate personal strategies when applying arithmetic operations (addition, subtraction, multiplication, or division) on whole numbers to create and solve problems. Justify the personal strategies used to solve problems. 	12	5	1	13.4/18 (74.4%)
Patterns and Relations <ul style="list-style-type: none"> Investigate, identify, and communicate rules for numerical and non-numerical patterns, in order to describe the world and to solve problems. Represent, solve, and communicate an addition or subtraction equation with one unknown number. 	3	4	1	5.8/8 (72.5%)
Shape and Space <ul style="list-style-type: none"> Estimate, measure, and compare, using personal referents and standards units of measurement to solve problems. Describe, classify, construct, and relate 3-D objects and 2-D shapes 	5	3	2	6.9/10 (69%)
Statistics and Probability <ul style="list-style-type: none"> Collect, organize, and interpret data in a variety of ways to solve problems. Construct, label, and interpret bar graphs to solve problems. 	1	3	0	2.9/4 (72.5%)
Provincial Student Achievement (Average Raw Score and Percentage)	16.4/21 (78.1%)	10.7/18 (59.4%)	1.8/4 (45.0%)	Total Test Raw Score 28.9/40 (72.3%)

Students' Strengths on 2011 PAT

1. Identifying the sequence of numbers, both forward and backward, from 0 to 1000 (N.1).
 - *counting forward and backward by 2, 3, 4, 5, 10, 25, and 100.*
 - *applying this understanding when solving problems*
2. Demonstrating an understanding of increasing and decreasing patterns (PR.1 and PR. 2).
 - *identifying numerical and non-numerical patterns in a variety of contexts (charts, pictures, number sequences, etc.)*
3. Measuring the length of objects using cm (SS.3 and SS.5).
 - *measuring objects using a ruler and solving a problem with the information*
 - *calculating perimeter*
4. Using collected data to answer questions (SP. 1).
 - *reading and comparing information on different types of graphs*
 - *solving problems using information from graphs*

Areas for Improvement on 2011 PAT

1. Mentally calculating basic facts and applying them in a problem solving situation (N.10 and N.11).

- *students need to efficiently add and subtract basic facts to 18*
- *students should be familiar with strategies to calculate multiplication and division facts to 5 x 5*

<http://erlc.wikispaces.com/Effective+Strategies+for+Learning+the+Basic+Facts>

2. Understanding the relationship between various time periods (seconds to minutes, minutes to hours, days to months) and measurements (cm to m and g to kg).

- students need to know and calculate the relationship between time periods, lengths, and/or masses when solving moderate to high-complexity problems

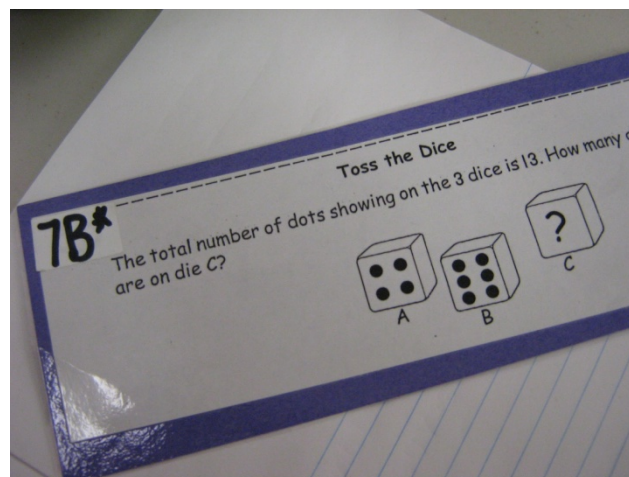
3. Adding and Subtracting 2- and 3-digit numerals up to 1 000 (N. 9).

- use personal strategies that are accurate and efficient to add and subtract numbers which may or may not require some type of re-grouping

4. Estimating quantities less than 1000, using referents (N.4).

- subitizing (K and Gr. 1) and use of referents (Gr. 2) are foundational concepts

How does information from the PATs help to improve classroom instruction and assessment?



Use your School Reports to Analyze and Learn from the PAT Data

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5	Results for Individual Multiple-Choice Items, by Reporting Category
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7	Individual Student Results, by Reporting Category

The information contained in the following pages will be useful for preparing your education plans and results reports. Please refer to "Guidelines for Interpreting the 2011 Achievement Tests, Detailed School and Authority Reports." For further explanation, contact Ken Marcellus, Director (Achievement Testing), Assessment Sector, via e-mail at: Ken.Marcellus@gov.ab.ca or call 780-427-0010 or toll free at 310-0000.

Use your School Reports to Analyze and Learn from the PAT Data

Table 1
Participation Report

	School		Province	
	Number	Percent	Number	Percent
Students Included:				
Students Writing the English Form ^a	43	100.0	35764	90.9
Students Not Included: ^b				
Students Absent	0	0.0	1737	4.4
Students Excused	0	0.0	1816	4.6
Students Who Wrote, Results Withheld	0	0.0	6	0.0
Total Students Not Included	0	0.0	3559	9.1
Total Enrollment Reported by Schools, June 2011	43	100.0	39323	100.0

Use your School Reports to Analyze and Learn from the PAT Data

Table 2.1
Standards Demonstrated by All Students ^a

	School		Province	
	Number	Percent	Number	Percent
Students for Whom Test Results are Available:	43	100.0	35764	90.9
Acceptable Standard ^b	39	90.7	30198	76.8
Standard of Excellence	17	39.5	10109	25.7
Below Acceptable Standard	4	9.3	5566	14.2
Students for Whom Test Results are Not Available: ^c	0	0.0	3559	9.1
Students Absent	0	0.0	1737	4.4
Students Excused	0	0.0	1816	4.6
Students Who Wrote, Results Withheld	0	0.0	6	0.0
Total Enrollment Reported by Schools, June 2011	43	100.0	39323	100.0

^a Includes all students registered in Grade 3 and ungraded students in year 3 of schooling. ^b Includes students who achieved the Standard of Excellence.

^c It is possible that some of these students, under different circumstances, could have demonstrated the standards on the test.

Use your School Reports to Analyze and Learn from the PAT Data

Table 2.2
Standards Achieved by Students Writing the Test

Reporting Category	Maximum Possible Score	Cut Score ^a	School n = 43		Province n = 35764	
			Number	Percent	Number	Percent
Acceptable Standard ^b						
Total Test	40	21	39	90.7	30198	84.4
Standard of Excellence						
Total Test	40	35	17	39.5	10109	28.3
Below Acceptable Standard						
Total Test	40	N/A	4	9.3	5566	15.6

^a The Cut Score is the lowest score on a test, determined by standard-setting procedures, that students must achieve for their performance to be judged "acceptable" and/or "excellent" in relation to provincial expectations.

^b

Use your School Reports to Analyze and Learn from the PAT Data

Table 3
Students Achieving Standards on Total Test, by Program

Program ^a	Total Writing				Achieved the Acceptable Standard				Achieved the Standard of Excellence			
	School		Province		School		Province		School		Province	
	n = 43	n = 35764	n = 39	n = 30198	n = 17	n = 10109						
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Regular ^b	28	65.1	26482	74.0	27	96.4	22874	86.4	15	53.6	8042	30.4
French Immersion	0	0.0	30	0.1	N/A	N/A	23	76.7	N/A	N/A	4	13.3
Francophone	0	0.0	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bilingual Language other than French	0	0.0	1060	3.0	N/A	N/A	938	88.5	N/A	N/A	359	33.9
English as a Second Language	7	16.3	5839	16.3	7	100.0	4748	81.3	2	28.6	1413	24.2
Special Education	8	18.6	2984	8.3	5	62.5	2100	70.4	0	0.0	461	15.4
Cycled ^c	0	0.0	111	0.3	N/A	N/A	79	71.2	N/A	N/A	10	9.0
Online Programming	0	0.0	49	0.1	N/A	N/A	43	87.8	N/A	N/A	11	22.4
Francisation	0	0.0	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other ^d	0	0.0	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

^a These reporting categories are not exclusive; some students are included in more than one category. ^b Refers

to students in programs not listed below.

^c Includes only those students who completed the course in a year before the date of testing. ^d

Program information unavailable or incomplete.

Use your School Reports to Analyze and Learn from the PAT Data

Table 4
Raw Score Results, by Reporting Category and by Gender^a

Reporting Category	Maximum Possible Score	School						Province					
		All Students n = 43		Female n = 16		Male n = 27		All Students n = 35764		Female n = 17436		Male n = 18328	
		Average	S. D. ^b	Average	S. D.	Average	S. D.	Average	S. D.	Average	S. D.	Average	S. D.
Total Test	40	31.3	6.6	32.4	5.0	30.7	7.5	28.9	7.7	28.6	7.7	29.2	7.7
LOC - Low ^c	21	17.2	3.4	17.6	2.7	16.9	3.7	16.4	4.1	16.3	4.0	16.4	4.1
LOC - Moderate	15	12.1	2.6	12.3	1.8	12.0	3.0	10.7	3.3	10.6	3.3	10.9	3.2
LOC - High	4	2.0	1.3	2.5	1.1	1.8	1.3	1.8	1.2	1.7	1.2	1.9	1.2
Number	18	14.4	3.5	15.3	2.0	13.9	4.0	13.4	3.8	13.2	3.9	13.5	3.8
Patterns & Relations	8	6.6	1.4	6.9	1.0	6.4	1.5	5.8	1.8	5.8	1.8	5.8	1.8
Shape & Space	10	7.1	2.0	7.1	2.1	7.1	1.9	6.9	2.1	6.8	2.1	6.9	2.1
Statistics & Probability	4	3.2	0.9	3.1	0.7	3.3	1.0	2.9	1.1	2.9	1.1	3.0	1.1

^a Students for whom gender information is not available are included in the "All Students" column only.

Use your School Reports to Analyze and Learn from the PAT Data

Table 5 – 1
Results for Individual Multiple-Choice Items, by Reporting Category

Item #	% Correct Sch. Prov.	Specific Outcome	Complexity	Item Description
3	88.4 74.1	N.2	Low	Identify the greatest number that is represented by base-ten blocks. (Also N.5)
4	83.7 83.5	N.3	Low	Recognize an error in the order of numbers on a given hundred chart.
6	69.8 76.2	N.9	Low	Calculate the difference between a one-digit number and a two-digit number.
11	76.7 75.7	N.5	Low	Identify a three-digit number that is represented by proportional materials (base-ten blocks). (Also N.2)
14	79.1 71.7	N.1	Low	Count forward by 4, starting from a three-digit number that is a multiple of 4. (Also PR.1)
16	95.3 86.9	N.3	Low	Compare and order three numbers from a bar graph. (Also SP.2)
19	65.1 74.7	N.13	Low	Recognize fifths as part of a whole.
20	90.7 89.0	N.11	Low	Relate a multiplication equation to repeated addition.
21	83.7 83.0	N.9	Low	Find the sum of two two-digit numbers which are represented as number words. (Also N.2)
23	81.4 74.8	N.1	Low	Count forward by 100 from a random starting point. (Also PR.1)

Strand

N - Number

PR - Patterns & Relations

SS - Shape & Space

SP - Statistics & Probability

Use your School Reports to Analyze and Learn from the PAT Data

Table 5 – 2
Results for Individual Multiple-Choice Items, by Reporting Category

Item #	% Correct Sch. Prov.	Specific Outcome	Complexity	Item Description
25	76.7 69.6	N.12	Low	Solve a problem that involves equal sharing and equal grouping. (Also N.1)
34	74.4 70.2	N.11	Low	Identify the operation used to calculate a product of 15.
30	79.1 76.4	N.8	Moderate	Select a number expression which represents one way to make an accurate estimate.
31	83.7 70.5	N.11	Moderate	Demonstrate an understanding of multiplication facts to 16 and use addition to solve a problem. (Also N.3 and N.9)
32	76.7 61.8	N.9	Moderate	Find the difference between two three-digit numbers, using symbols and/or pictures.
33	83.7 58.7	N.4	Moderate	Estimate a quantity of less than 1000.
40	83.7 82.0	N.12	Moderate	Recognize a group of objects that can be divided into 5 equal groups.
13	67.4 56.5	N.2	High	Identify the number expression that represents a three-digit number. (Also N.9)
9	81.4 75.9	PR.4	Low	Solve an equation which contains a symbol representing an unknown number.
24	90.7 81.7	PR.1	Low	Use a chart, which displays an increasing (by 3) number pattern, to solve a problem. (Also N.1)

Strand

N - Number

PR - Patterns & Relations

SS - Shape & Space

SP - Statistics & Probability

Use your School Reports to Analyze and Learn from the PAT Data

Table 5 – 3
Results for Individual Multiple-Choice Items, by Reporting Category

Item #	% Correct Sch. Prov.	Specific Outcome	Complexity	Item Description
39	88.4 75.0	PR.2	Low	Identify the next set of shapes in a decreasing pattern.
10	90.7 76.0	PR.3	Moderate	Categorize a two-digit number according to the attributes of even and odd. (Also N.3)
29	90.7 81.6	PR.1	Moderate	Compare two patterns in order to identify a pattern rule (increase by 5). (Also N.1)
35	88.4 73.7	PR.1	Moderate	Extend an increasing pattern and predict the number of items in the next shape. (Also N.1)
37	81.4 76.1	PR.3	Moderate	Identify a Venn diagram in which numbers are sorted based on one attribute. (Also SP.1 and SS.1)
28	51.2 39.7	PR.4	High	Complete a subtraction equation by determining the unknown number. (Also N.9)
1	90.7 82.7	SS.7	Low	Analyze and sort groups of 2-D shapes.
2	86.0 80.5	SS.5	Low	Calculate the perimeter of a given shape. (Also N.1)
5	62.8 73.8	SS.6	Low	Classify 3-D objects by identifying the number of edges and the shapes of faces.
22	95.3 88.1	SS.1	Low	Relate the passage of time (days) to a common activity, using a calendar.

Strand

N - Number

PR - Patterns & Relations

SS - Shape & Space

SP - Statistics & Probability

Use your School Reports to Analyze and Learn from the PAT Data

Table 5 – 4
Results for Individual Multiple-Choice Items, by Reporting Category

Item #	% Correct Sch. Prov.	Specific Outcome	Complexity	Item Description
27	67.4 63.1	SS.1	Low	Relate the number of months to a year. (Also Grade 2, SS.1)
7	74.4 68.5	SS.5	Moderate	Measure and compare the perimeters of shapes illustrated on geoboards.
12	67.4 66.0	SS.4	Moderate	Locate the three objects whose total mass(g) balances the mass(g) of another object on a scale. (Also N.9)
26	79.1 77.0	SS.3	Moderate	Measure objects (cm) and compare their lengths.
15	27.9 31.1	SS.3	High	Understand and use the relationship between cm and m to determine the length of an object. (Also N.1)
18	58.1 56.3	SS.2	High	Relate minutes to hours to solve a problem. (Also N.9 and N.13)
8	90.7 86.6	SP.1	Low	Identify the line plot graph that represents data from a tally mark chart.
17	74.4 61.0	SP.2	Moderate	Solve a problem by drawing a conclusion about information from a bar graph. (Also N.9)
36	88.4 76.8	SP.1	Moderate	Interpret data from a pie chart and select a graph that accurately represents the same information.
38	69.8 67.3	SP.1	Moderate	Analyze data from a list and identify the corresponding bar graph. (Also SP.2)

Strand

N - Number

PR - Patterns & Relations

SS - Shape & Space

SP - Statistics & Probability

Use your School Reports to Analyze and Learn from the PAT Data

Table 6
Results on 2010 and 2011 Items^a

	2010 Achievement Test			2011 Achievement Test		
	No. of Items	School Average n = N/A	Provincial Average n = N/A	No. of Items	School Average n = N/A	Provincial Average n = N/A
Common Items: Items appearing on both the 2010 and 2011 tests	N/A	N/A	N/A	N/A	N/A	N/A
Unique Items: Items appearing on only the 2010 or the 2011 tests, but not on both	N/A	N/A	N/A	N/A	N/A	N/A

^a This test was administered for the first time in 2011. As such, common and unique item performance reporting is not applicable.

Use your School Reports to Analyze and Learn from the PAT Data

Table 7 - Individual Student Results by Reporting Category

Student Name	Program(s)	Accommodation(s)	Total Test	LOC - Low	LOC - Moderate	LOC - High	Number	Patterns & Relations	Shape & Space	Statistics & Probability
			40	21	15	4	18	8	10	4
Anna	1		37	21	14	2	18	8	7	4
Antony	1		38	20	15	3	17	8	9	4
Arnold	5		22	12	9	1	12	5	3	2
Ava	6		32	17	13	2	15	6	7	4
Barbara	6		16	9	7	0	8	2	4	2
Benny	1		35	19	14	2	16	7	8	4
Bill	1		34	18	13	3	17	8	6	3
Brian	1		34	18	14	2	17	7	8	2
Candice	1		35	19	12	4	17	6	9	3
Carly	6		25	16	8	1	9	7	6	3
Charles	1		33	18	12	3	15	7	7	4
Colton	5		34	18	12	4	14	8	9	3
Cris	1		14	8	6	0	6	3	3	2
Devin	1		39	21	15	3	18	8	9	4
Douglas	1		36	21	14	1	16	7	9	4
Fritz	5		33	18	12	3	18	4	7	4
Gerry	6		34	19	12	3	15	7	8	4
Greta	6		26	15	9	2	14	6	4	2
Haley	1		35	18	14	3	17	7	7	4
Howard	5		31	19	11	1	15	7	7	2

Grades 3, 6, and 9 Programs

Accommodations

M – Machine Scored

- 1 - Regular
- 2 - French Immersion
- 3 - Francophone
- 4 - Bilingual other than French
- 5 - English as a Second Language

- 6 - Special Education
- 7 - Cycled
- 8 - Online Programming
- 9 - Knowledge and Employability
- 10 - Francisation
- 11 - Other

- 1 - visual impairment, used audio version of the test
- 2 - learning or physical disability, used audio version of the test
- 3 - additional writing time
- 4 - calculator

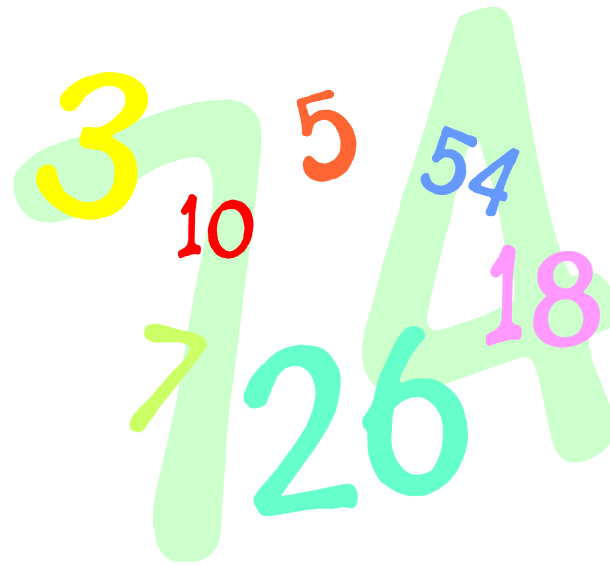
- 5 - scribe
- 6 - large print
- 7 - braille
- 8 - reader
- 9 - sign language interpreter
- 0 - taped response

Use your School Reports to Analyze and Learn from the PAT Data

General Outcomes	Multiple Choice (MC) Questions	LOC L	LOC M	LOC H	Proportion of MC Questions per Strand
<p>Number Develop and demonstrate number sense for whole numbers 0 to 1000 and understand fractions as part of a whole.</p> <p>Develop and demonstrate personal strategies when applying arithmetic operations (addition, subtraction, multiplication or division) on whole numbers to create and solve problems. Justify the personal strategies used to solve problems.</p>	18	3, 4, 6, 11, 14, 16, 19, 20, 21, 23, 25, 34	30, 31, 32, 33, 40	13	45%
<p>Patterns and Relations Investigate, identify, and communicate rules for numerical and non-numerical patterns, in order to describe the world and to solve problems.</p> <p>Represent, solve, and communicate an addition or subtraction equation with one unknown number.</p>	8	9, 24, 39	10, 29, 35, 37	28	20%
<p>Shape and Space Estimate, measure, and compare, using personal referents and standard units of measurement to solve problems.</p> <p>Describe, classify, construct, and relate 3-D objects and 2-D shapes</p>	10	1, 2, 5, 22, 27	7, 12, 26	15, 18	25%
<p>Statistics and Probability Collect, organize, and interpret data in a variety of ways to solve problems.</p> <p>Construct, label, and interpret bar graphs to solve problems.</p>	4	8	17, 36, 38		10%
Number of Questions	40	21	15	4	40
Percent of Test	100%				100%

Use your School Reports to Analyze and Learn from the PAT Data

Take a look at your school report and analyze the data for each question using the Test Blueprint.



Use your School Reports to Analyze and Learn from the PAT Data

What were your students' strengths?

Were there some areas where your students could improve?

How can your K-3 teaching team support mathematics learning in each grade?



What can I do to ensure that my students are ready for the PAT?



Know the Outcomes in the Program of Studies

Most Effective Teaching and Assessment Strategies

Strategy	Rank
Know the Program of Studies thoroughly	1
Make learning outcomes known to students	2
Use rubrics, exemplars, and criteria	3
I CAN statements	4
Continuous informal feedback	5
Questioning skills	6
Use of portfolios	7
Student self-assessment	8

Research Source:

http://education.alberta.ca/media/6412192/research_review_assessment_2010.pdf

Know the Program of Studies Thoroughly

1. The basic beliefs about students and how they learn mathematics are taken into account.

- students must build on their own experiences and prior knowledge
- mathematical experiences should proceed from simple to complex and from concrete to abstract
- active engagement is fostered by using a variety of materials, tools and contexts



Know the Program of Studies Thoroughly

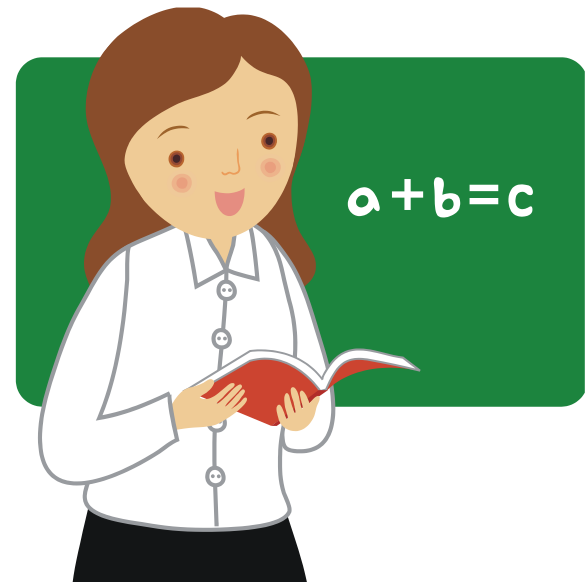
- student discussions are an essential part of mathematics learning
- a safe environment encourages positive attitudes, curiosity, and risk-taking
- problems can be solved in a variety of ways
- a variety of teaching and assessment strategies are essential
- students need to set and assess their personal goals

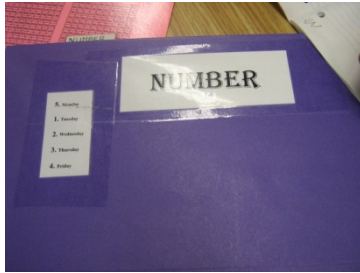


Know the Program of Studies Thoroughly

2. The critical processes involved in learning mathematics are related to assessment practices.

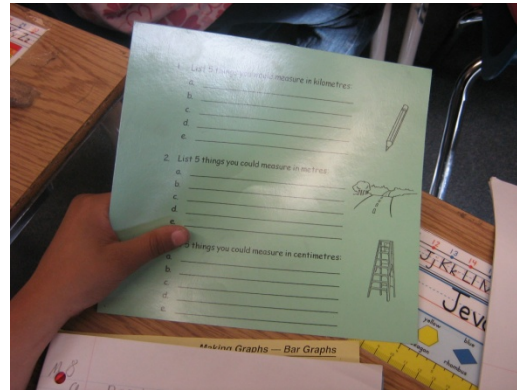
- ✓ Communication [C]
- ✓ Connections [CN]
- ✓ Mental Mathematics and Estimation [ME]
- ✓ Problem Solving [PS]
- ✓ Reasoning [R]
- ✓ Technology [T]
- ✓ Visualization [V]





COMMUNICATION [C]

Students need to read about, represent, view, write about, listen to, and discuss mathematical ideas in order to make meaningful connections.



COMMUNICATION [C]

How does this relate to assessment?

- ✓ Questions incorporate various forms of communication
 - pictures, graphs, charts, diagrams, lists, and words
- ✓ Understanding mathematical terminology
 - accurate terminology will be used
 - students should be familiar with mathematical terms in the Mathematics Program of Study (K-3)

COMMUNICATION [C]

Examples of mathematical terminology used on the PAT:

represent equation calculate difference locate classify

estimate skeleton prism numerator denominator array

line plot perimeter balance equal core

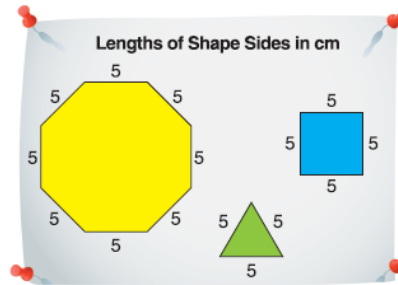
divide multiply fraction ascending length width data

quadrilateral polygon expression descending label identify

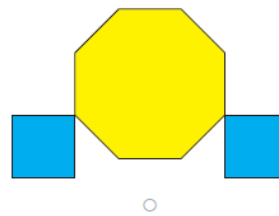
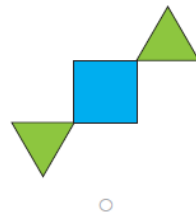
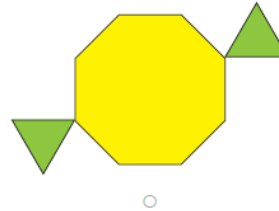
*A complete list of K-3 terminology is located in *A Guide for Teachers* at <http://education.alberta.ca/admin/testing/achievement.aspx>

COMMUNICATION [C]

Students look at a chart that shows some shapes and the lengths of their sides.



Which of the following sets of shapes has a **TOTAL** perimeter of 50 cm?



CONNECTIONS [CN]

Students view mathematics as useful, relevant, and integrated when mathematical ideas are connected to each other or to real-world phenomena.

<http://education.alberta.ca/teachers/program/math.aspx>

CONNECTIONS [CN]





How does this relate to assessment?

- ✓ Problem solving exists within a context
 - Contexts that students can relate to are used, such as curriculum-based topics or school-related activities
Ex. questions using rocks and minerals as a context
- ✓ Questions require that students apply their mathematical understanding across the strands
 - Each questions may assess more than one outcome

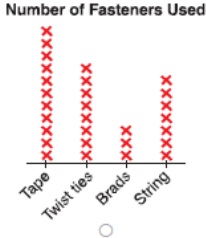
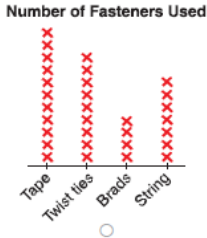
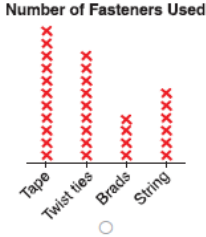
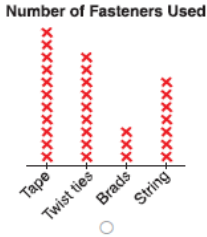
CONNECTIONS [CN]

Students keep track of the number of fasteners that they use for their building projects.

Number of Fasteners

	Tape	
	Twist ties	
	Brads	
	String	

The line plot that has the same information as the tally chart shown above is



MENTAL MATHEMATICS AND ESTIMATION [ME]

Mental Mathematics:

Students are able to combine cognitive strategies that enhance flexible thinking and number sense. They can calculate mentally without the use of external memory aids.

MENTAL MATHEMATICS AND ESTIMATION [ME]

Estimation:

Students are able to determine approximate values or determine reasonableness of calculated values. Benchmarks or referents are often used.

MENTAL MATHEMATICS [ME]

How does this relate to assessment?

- ✓ Students use mental mathematics strategies to solve problems
 - efficiently calculate addition and subtraction basic facts
 - know and understand multiplication and division facts up to 5×5
 - “friendly” numbers (ex. $49 + 48 = ?$) will often be used when this process is part of an outcome
 - calculators will not be used during the test

MENTAL MATHEMATICS [ME]

Dan estimates that the sum of $43 + 56$ is close to 100.

Which of the following ways shows how Dan could make this estimate?

- $40 + 60$
- $56 - 43$
- $60 - 40$
- $100 + 60$

MENTAL MATHEMATICS [ME]

Scott has four sets of multiplication cards. He calculates the answer for each question. Then Scott calculates the sum of each set.

$$4 \times 4 = \square$$

$$1 \times 4 = \square$$

$$2 \times 1 = \square$$

$$5 \times 2 = \square$$

Set **A**

Set **B**

$$2 \times 2 = \square$$

$$3 \times 1 = \square$$

$$3 \times 4 = \square$$

$$4 \times 2 = \square$$

Set **C**

Set **D**

Which set of cards has a sum that is closest to 20?

- Set A
- Set B
- Set C
- Set D

ESTIMATION [ME]

How does this relate to assessment?

- ✓ Students know when and how to use estimation
 - Questions will involve the use of referents

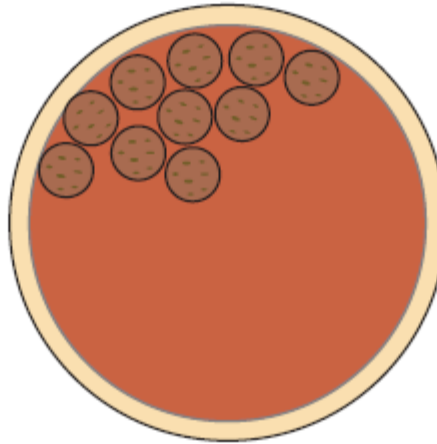
Ex. A referent will be given and students are expected to make an estimation

OR

Students are given a problem and must determine and justify the referent that should be used

ESTIMATION USING A GIVEN REFERENT

Sarah is placing pepperoni slices on a pizza.

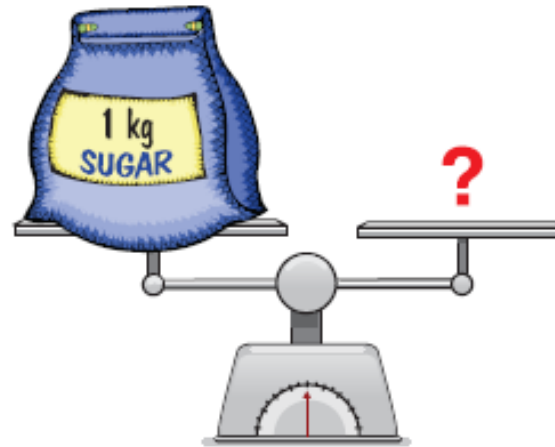


About how many pepperoni slices will Sarah need to cover the whole pizza without overlapping the slices?

- 20 slices
- 35 slices
- 65 slices
- 80 slices

ESTIMATION BY CHOOSING AN APPROPRIATE REFERENT

Bob puts a 1 kg bag of sugar on a scale.



Which of the following items is **CLOSEST** in mass to 1 kg?

- Dictionary
- Glue stick
- Calculator
- Tissue box

PROBLEM SOLVING [PS]

Learning through problem solving is the focus of the revised mathematics curriculum.

- ✓ A true problem requires students to use prior learning in new ways and contexts.
- ✓ Conceptual understanding is the focus rather than procedural activity.

“Problem solving is what you do when you don’t know what to do.”

“If students have already been given ways to solve the problem, it is not a problem, but practice.”

PROBLEM SOLVING [PS]

How does this relate to assessment?

- ✓ New problem solving situations will be presented; students may not have seen this exact problem before
- ✓ A variety of strategies can be used to solve problems; students are encouraged to work directly in the test booklet
- ✓ Solving problems will require the application of specific outcomes from within a strand and/or across the strands

PROBLEM SOLVING [PS]

During the month of August, Jan walks her dog every Monday, Wednesday, and Saturday.

August						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

On how many days does Jan walk her dog in the month of August?

- 4 days
- 9 days
- 13 days
- 31 days

PROBLEM SOLVING [PS]

Sandy can earn points for each level she plays in a computer game.

Level	Points Earned
1	10
2	20
3	40
4	80
5	?

If the pattern of points earned continues, then how many points can Sandy earn for level 5?

- 100 points
- 120 points
- 150 points
- 160 points

REASONING [R]

- ✓ Reasoning skills help students think logically and make sense of mathematics.
- ✓ Reasoning skills enable students to use a logical process to
 - Analyze a problem
 - Reach a conclusion
 - Justify or defend that conclusion

REASONING [R]

How does this relate to assessment?

- ✓ Problems may involve the recording and analysis of results.
- ✓ Coming to a conclusion based on what a student knows or has learned from their analysis.
- ✓ Making generalizations based on patterns.

REASONING [R]

There are 18 skipping ropes in the gym. Andrew takes half of these skipping ropes outside. Then Kavi takes 6 of Andrew's skipping ropes back to the classroom.



After Kavi takes the 6 skipping ropes, how many skipping ropes does Andrew still have?

- 12
- 9
- 6
- 3

TECHNOLOGY [T]

- ✓ Contributes to learning a wide range of outcomes
- ✓ Enables students to
 - Explore and create patterns
 - Examine relationships and test ideas
 - Solve problems
- ✓ At the grade three level, technology is a part of the learning environment but is not used on the PAT.

VISUALIZATION [V]

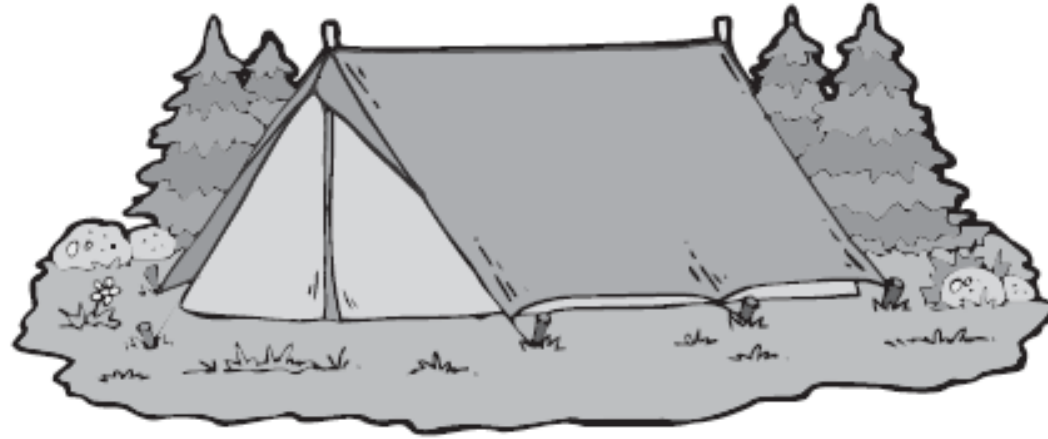
- ✓ Thinking in pictures and images
- ✓ Visual images and reasoning are key components of
 - Number sense (mental representations of numbers)
 - Spatial sense (relationship between 2-D and 3-D objects)
 - Measurement sense (when to measure, when to estimate, and which estimation strategies to use)

VISUALIZATION [V]

How does this relate to assessment?

- ✓ Students with strong visualization skills are able to
 - picture the relationships between shapes
 - make accurate estimations in measurement situations
 - manipulate numbers in their minds
 - Ex. When asked to add 54 and 23, a student who is able to visualize numbers, particularly “10”, can mentally add $50 + 20$ to get 70 and then add $4 + 3$ to the number 70 to get 77. Pencil and paper are not required to answer the question.

VISUALIZATION [V]



The tent shown above is an example of a prism that has faces in the shape of a

- circle and a square
- triangle and a square
- rectangle and a circle
- triangle and a rectangle

Know the Program of Studies Thoroughly

3. The concepts which describe the nature of mathematics are imbedded in the assessment tasks.

- ✓ Change
- ✓ Constancy
- ✓ Number Sense*
- ✓ Patterns*
- ✓ Relationships
- ✓ Spatial Sense
- ✓ Uncertainty

Know the Program of Studies Thoroughly

4. The organization of the program of studies informs test blueprint development.

Strands

- **Number**

- **Patterns and Relations**
 - Patterns
 - Variables and Equations

- **Shape and Space**
 - Measurement
 - 3-D Objects and 2-D Shapes

- **Statistics and Probability**
 - Data Analysis
 - Chance and Uncertainty (No Specific Outcomes in K-3)

Outcomes

➤ General Outcome (GO)

These are overarching statements about what students are expected to learn in each strand. They are the same throughout the grades.

➤ Specific Outcome (SO)

These are statements that identify the specific skills, understanding and knowledge that students are expected to have by the end of each grade.

Achievement Indicators:

Outline a range of expectations at that grade level.

Note: In the SOs the word *including* indicates that ALL of the following items must be addressed. The phrase *such as* indicates that the items that follow are there for clarification and are NOT requirements that must be addressed fully.

Links to Information and Communication Technology (ICT) Outcomes

Some curriculum outcomes are linked to the ICT program of studies.

These ICT links have been identified for some specific outcomes.

They appear in square brackets below the process codes for an outcome, where appropriate.

An example from Grade Three:

Statistics and Probability

SO 1: Collect first-hand data and organize it ...

[ICT: C4-1.3] (full description of the outcome is in the appendix)

Know the Program of Studies Thoroughly

5. The instructional focus, which describes the approach that teachers will be taking when teaching mathematics, informs the test development process.

Instructional Focus

1. The four strands are not intended to be discrete units of instruction. Students should make connections between concepts both within and across the strands.
2. Mathematical processes should be integrated within each strand.
3. Decreased emphasis should be placed on procedural (rote calculation, following a given set of “steps”) and more time spent on concept development.

Instructional Focus Continued...

4. Problem solving, reasoning and connections must be integrated throughout the program.
5. Mental mathematics, estimation, paper and pencil exercises and the use of technology should be balanced.
6. Concepts should be introduced using manipulatives and be developed concretely, pictorially and symbolically.

“...the question is not whether manipulatives are used but how they are used...the emphasis should be on mental rather than physical activity.” --Grayson Wheatley

7. Recognize that students will be at varying developmental stages.

Know the Program of Studies Thoroughly

6. A test blueprint is built based on the overall purposes of the Program of Studies (front matter) and the Specific Outcomes for Grade 3

Specific Outcomes

1. Number:
13 Outcomes
2. Patterns and Relations:
4 Outcomes
3. Shape and Space:
7 Outcomes
4. Statistics and Probability:
2 Outcomes



How is the Mathematics Achievement Test designed?



Research on Test Development

“Both the content of the test and the cognitive processes engaged in taking the test should adequately represent the curriculum”

American Educational Research Association (2000). *AERA position statement concerning high stakes testing in preK-12 education*. Retrieved July 29, 2005 from www.aera.net/policyandprograms/?id=378



Overview of the Test Design Process



The Construction of the Mathematics PAT

The information in the “front matter” of the curriculum and the content of the Specific Outcomes were both considered as the blueprint was being developed.

Teachers determined:

1. The strands/outcomes that should be emphasized.
2. The outcomes that could be tested using multiple-choice questions.
4. The balance of questions from each strand.
5. The number of questions and the length of the test.

Blueprint for the Grade 3 Mathematics Achievement Test (Revised for 2011)

General Outcomes	Multiple Choice (MC) Questions	Proportion of MC Questions per Strand
<p>Number Develop and demonstrate number sense for whole numbers 0 to 1000 and understand fractions as part of a whole. Develop and demonstrate personal strategies when applying arithmetic operations (addition, subtraction, multiplication or division) on whole numbers to create and solve problems. Justify the personal strategies used to solve problems.</p>	18	45%
<p>Patterns and Relations Investigate, identify, and communicate rules for numerical and non-numerical patterns, in order to describe the world and to solve problems. Represent, solve, and communicate an addition or subtraction equation with one unknown number.</p>	8	20%
<p>Shape and Space Estimate, measure, and compare, using personal referents and standard units of measurement to solve problems. Describe, classify, construct, and relate 3-D objects and 2-D shapes</p>	10	25%
<p>Statistics and Probability Collect, organize, and interpret data in a variety of ways to solve problems. Construct, label, and interpret bar graphs to solve problems.</p>	4	10%
Number of Questions	40	40
Percent of Test	100%	100%

What kinds of questions will be on the PAT?



The Questions on the Mathematics PAT

General Characteristics of PAT Questions

1. Assess one or more specific outcomes.
2. Reflect the intent and direction given in the front matter.
3. Are at an appropriate reading level.
4. Use a context applicable to students.
5. Meet the criteria for an effectively constructed multiple choice question.
6. Meet with the standards set out by Respecting Diversity and Promoting Respect (RDPR).
7. Are statistically valid.

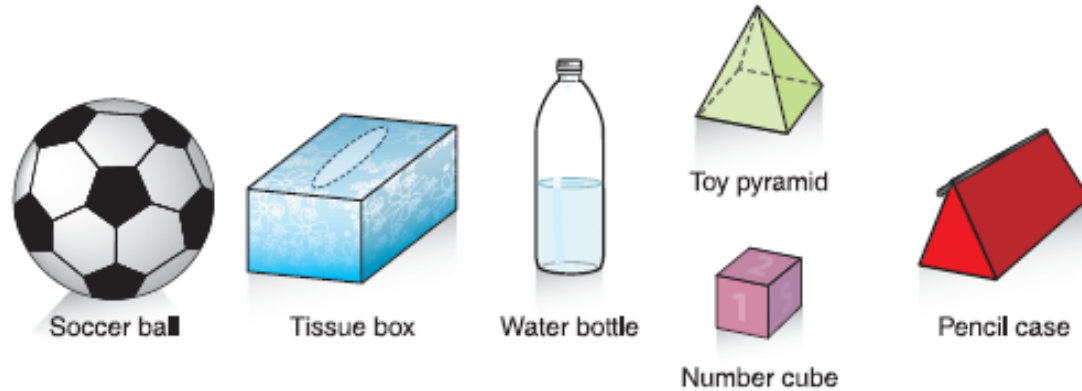
(Difficulty between .300 and .900, CRPB above .200)

The Questions on the Mathematics PAT

Questions Must Meet Statistical Requirements

The following items were found in the Lost and Found box at school.

Lost and Found Items



The two objects that have a sum of 10 faces are the

- toy pyramid and pencil case
- tissue box and soccer ball
- toy pyramid and water bottle
- soccer ball and number cube

The Questions on the Mathematics PAT

<i>Item</i>	<i>Key</i>	<i>Level of Complexity</i>		<i>Item Descriptor</i>	<i>Diff.</i>	<i>CRPB</i>
1014MC30	A	Moderate	SS.6	Calculate the number of faces on 3-D objects. (Also N.9)	.668	.412

This item meets all the major standards

MC Item #31	GROUP	N	NR	NF	OMIT	A*	B	C	D
Dif: 0.668	Total:	392	4	0	4	0.668	0.163	0.064	0.094
Rpb: 0.463	High:	125	1			0.904	0.056	0.024	0.008
Crpb: 0.412	Mid:	154	2			0.682	0.175	0.045	0.084
95% Con:	Low:	113	1			0.389	0.265	0.133	0.204
	Test Score Means:					26.737	20.438	19.240	17.189
Rbis: 0.600	Discriminating Power:		-0.109			-0.209	0.515		-0.196
Crbis: 0.533	Standard Error of D.P.:		0.004			0.006	0.000		0.005
Iri: 0.218									

The Questions on the Mathematics PAT

Questions Classified Based on Cognitive Complexity (Norman Webb, 2002)

Low-Complexity Questions

These questions typically require students to recall and/or recognize basic mathematical concepts and procedures. Students are not expected to come up with original methods for finding a particular solution.

The Questions on the Mathematics PAT

Low-complexity questions require students to:

- Recall a basic fact, term or definition
- Perform a specific procedure (+, -, x, ÷)
- Solve a one-step or simple two-step problem
- Identify an example of a concept
- Determine an unknown number in an equation or expression
- Draw, measure, or describe a 2-D shape or 3-D object
- Retrieve information from a graph, table, or figure

The Questions on the Mathematics PAT

Questions Classified Based on Cognitive Complexity (Norman Webb, 2002)

Moderate-Complexity Questions

These questions typically involve more flexibility of thinking than those in the low-complexity category. They require a response that goes beyond the habitual and may involve more than a single step. The student is expected to decide what to do, to use reasoning and problem-solving strategies, and to bring together their skills and knowledge in order to find a solution.

The Questions on the Mathematics PAT

Moderate-complexity questions require students to:

- Solve a word problem requiring multiple steps
- Compare patterns, data, or equations
- Provide or recognize justification for a solution process
- Interpret a concrete, pictorial, or symbolic representation
- Retrieve information from a graph and use it when solving a multi-step problem
- Formulate a generalization about one or more objects or patterns



The Questions on the Mathematics PAT

Questions Classified Based on Cognitive Complexity (Norman Webb, 2002)

High-Complexity Questions

These questions typically require students to engage in more abstract reasoning, planning, analysis, judgment, and creative thought.



The Questions on the Mathematics PAT

High-complexity questions require students to:

- Perform a procedure which has multiple steps and multiple decision points
- Analyze similarities and differences between procedures and concepts
- Formulate an original problem
- Solve a problem in more than one way
- Explain and justify a solution to a problem
- Describe, compare, and contrast solution processes
- Provide a mathematical justification

The Questions on the Mathematics PAT

Samples of Low, Moderate, and High Complexity Questions



Low-complexity:

If two children share the cookies on the plate equally, then how many cookies does each child have? (N.12)

Moderate-complexity:

The twelve cookies on the plate can be put into different arrays. Create all the arrays that can be made with the cookies and write the matching multiplication equation for each array. (N.11)

High-complexity:

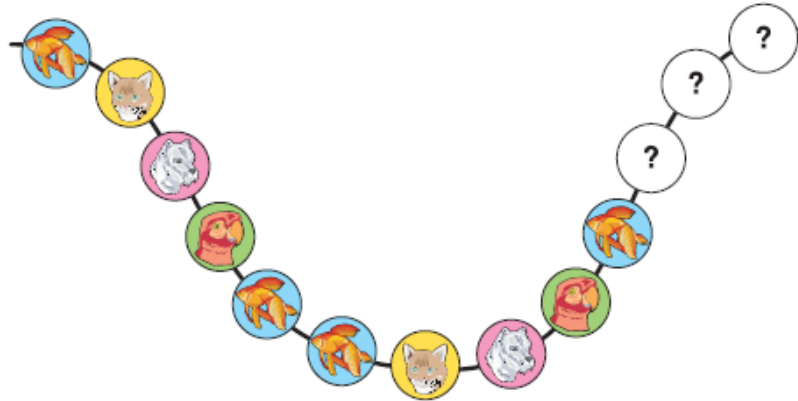
All twelve cookies on the plate are eaten by four children.

- Ann eats 2 cookies
- Lee eats more cookies than Joe
- Joe eats more cookies than Ann
- Ray eats fewer cookies than Joe

How many cookies does each child eat? (N.9, N.10)

The Questions on the Mathematics PAT – Determining LOC Activity

The beads on a necklace form the pattern shown below.



If the pattern continues, then the next three beads will be

-
-
-
-

The Questions on the Mathematics PAT – Determining LOC Activity

Sue makes 3-digit numbers using the numerals on the three cards shown below.

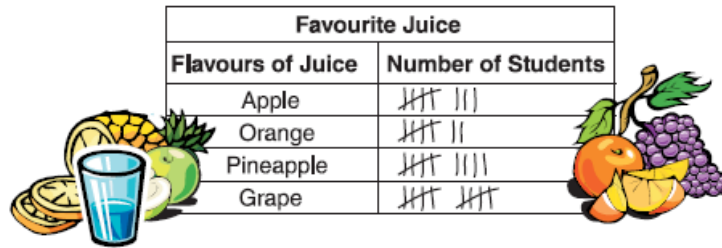


Which of the following 3-digit numbers has the **GREATEST** value with 9 in the tens position?

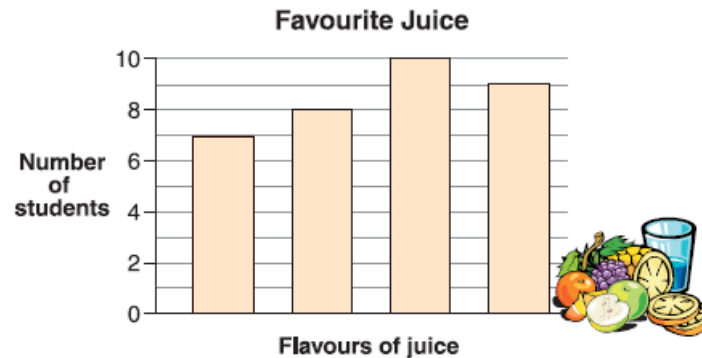
- 987
- 897
- 879
- 798

The Questions on the Mathematics PAT – Determining LOC Activity

The results of a survey are shown on the following tally chart.



The same results are shown on the following bar graph.



In order from left to right, the bars in the bar graph should be labelled

- orange, apple, grape, pineapple
- apple, orange, grape, pineapple
- orange, apple, pineapple, grape
- apple, orange, pineapple, grape

The Questions on the Mathematics PAT – Determining LOC Activity

Krista is making a Peruvian mask. She uses the following shapes:

- 5 triangles
- 7 quadrilaterals
- 4 hexagons

Which of the following masks is Krista's?



The Questions on the Mathematics PAT – Determining LOC Activity

A drop of water falls from a water faucet once every 3 seconds.

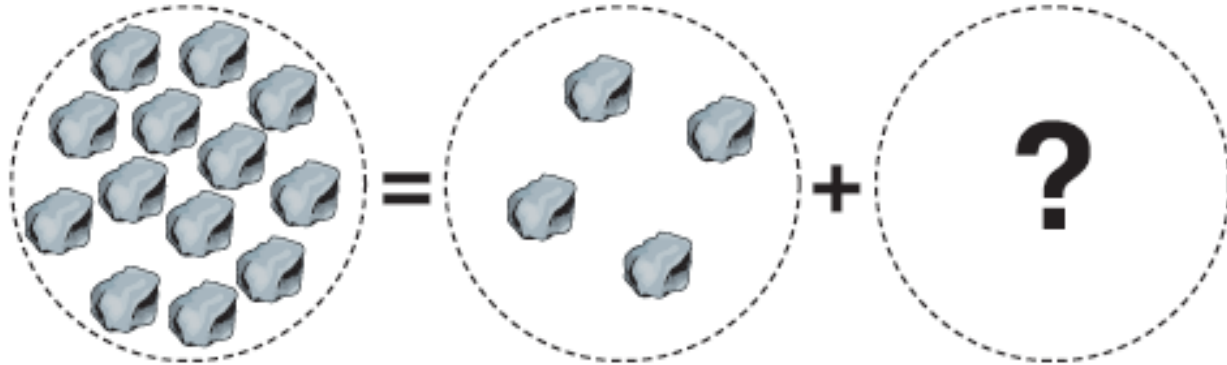


How many water drops will fall in 60 seconds?

- 60
- 30
- 20
- 10

The Questions on the Mathematics PAT – Determining LOC Activity

Justin groups some rocks to show the equation $13 = 4 + \textcircled{?}$.



The number missing from Justin's equation is

- 5
- 9
- 13
- 17

The Questions on the Mathematics PAT – Determining LOC Activity

Jan is saving money to buy a toy for her dog. Every week, Jan puts \$3 into her money jar.

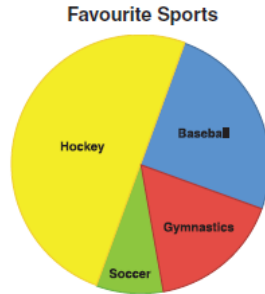
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
\$3	\$6	\$9					

How much money will Jan have in her money jar at the end of the 8th week?

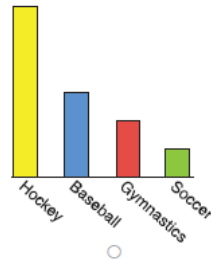
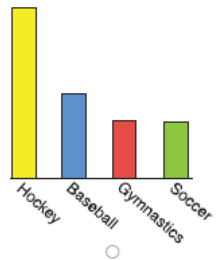
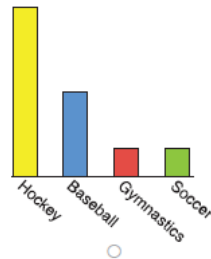
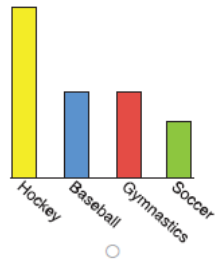
- \$21
- \$24
- \$26
- \$27

The Questions on the Mathematics PAT – Determining LOC Activity

Students choose their favourite sports and record the results on the chart below.



Which of the following graphs shows the same information as the chart?



The Questions on the Mathematics PAT – Determining LOC Activity

There are 236 passengers on an airplane. The airplane has 315 seats.

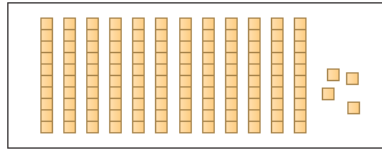


If all the passengers sit in their own seats, then the number of empty seats on this airplane is

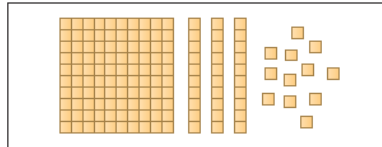
- 79
- 89
- 121
- 551

The Questions on the Mathematics PAT – Determining LOC Activity

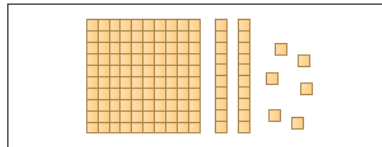
Julia represents four numbers using base ten blocks.



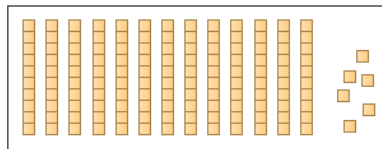
A



B



C



D

The two pictures that TOGETHER represent a sum of 260 are

- A and B
- A and D
- B and C
- C and D

The Questions on the Mathematics PAT – Determining LOC Activity

Erin compares the following two groups of numbers.

Group A	Group B
384, 389, 394, 399	687, 692, 697, 702

The number patterns in Group A and Group B both show skip counting by

- three
- five
- twenty-five
- one hundred

When all of the questions are put together on the PAT, it is also analyzed by asking:

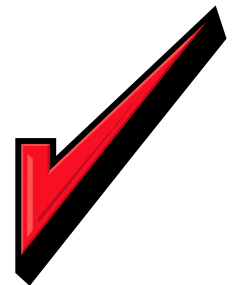
Is each question based on one or more outcomes in the Program of Studies?
Does each question align with the intent of the Program of Studies?

Does the examination have an appropriate balance of low, moderate and high complexity questions?

Have the test blueprint requirements been met?

Does the key have a relatively equal number of A, B, C, and D keyed responses?

Is the test at an appropriate, overall difficulty level?



What support materials for assessment are available?

1. Assessment Highlights

<http://education.alberta.ca/admin/testing/achievement/highlights.aspx>

2. Mathematics Subject Bulletin

<http://education.alberta.ca/admin/testing/achievement/bulletins.aspx>

3. Previously Released Examinations and Quest A+

<http://education.alberta.ca/admin/testing/achievement.aspx>

4. A Guide for Teachers – Grade 3 Mathematics 2011-2012

<http://education.alberta.ca/admin/testing/achievement.aspx>

What support materials for instruction are available?

1. Mathematics Program of Studies

<http://education.alberta.ca/teachers/program/math/educator/progstudy.aspx>

2. Authorized Resources

<http://education.alberta.ca/teachers/program/math/educator/resources.aspx>

3. Support Materials

<http://education.alberta.ca/teachers/program/math/educator/materials.aspx>

4. FAQs for Educators

<http://education.alberta.ca/teachers/program/math/educator/faq.aspx>

5. Fact Sheets and Useful Links

<http://education.alberta.ca/teachers/program/math/educator/links.aspx>

6. Learn Alberta

<http://www.learnalberta.ca/Home.aspx>

How can I get involved in the provincial achievement test development process?



OPPORTUNITIES FOR INVOLVEMENT

1. Classroom Field Testing
2. Summer Marking (ELA and FLA)
3. Standard Setting Working Group
4. Technical Advisory Groups
5. Item Writing Groups



Questions and Answers



we engage
engager

