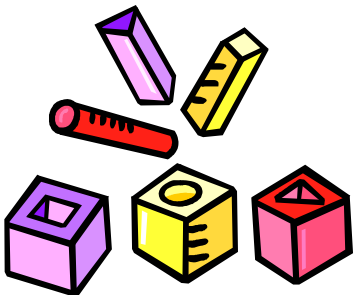


# 2007 Mathematics ISAT

Grades 3 through 8


Aligned to the Illinois Mathematics  
Assessment Framework





# ISAT Test-Development Contractor: Harcourt

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- All Items Align to the Illinois Mathematics Assessment Framework (IMAF)
- Norm-referenced and criterion-referenced items
- Stanford 10 format with **color** 
- Extended-time sessions for all students

# NCLB and Mathematics

- All states must assess mathematics in grades 3 through 8 by the 2005-2006 school year
- Mathematics is used for Adequate Yearly Progress (AYP)
- Annual Targets for Performance and Participation



# Test Preparation



- Be familiar with the Illinois Learning Standards and the Assessment Frameworks.
- Integrate test-taking skills into regular classroom instruction.
- Practice different item formats with students.
- Create a positive atmosphere for testing.



# 2007 Mathematics ISAT

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- All test items on the 2007 ISAT align to the Illinois Mathematics Assessment Framework
  - Norm-referenced Stanford 10 items
    - Same items taken in other states for national comparison
  - Criterion-referenced items
    - Illinois-developed and used only in Illinois
- All items contribute to the overall ISAT scale score.



# ISAT Mathematics Sessions

## Grades 3-8

Test Window: March 12-23, 2007\*

Session 1	40* Multiple-Choice Items  *The first 30 items are an abbreviated form of the Stanford 10.
Session 2	30 Multiple-Choice Items (5 are pilot) 3 Short-Response Items (1 is pilot)
Session 3	2 Extended-Response Items (1 is pilot)

\*See [www.isbe.net/assessment/pdfs/Modification\\_2007.pdf](http://www.isbe.net/assessment/pdfs/Modification_2007.pdf) for more details about how to modify the test window dates.



# 2007 Mathematics ISAT

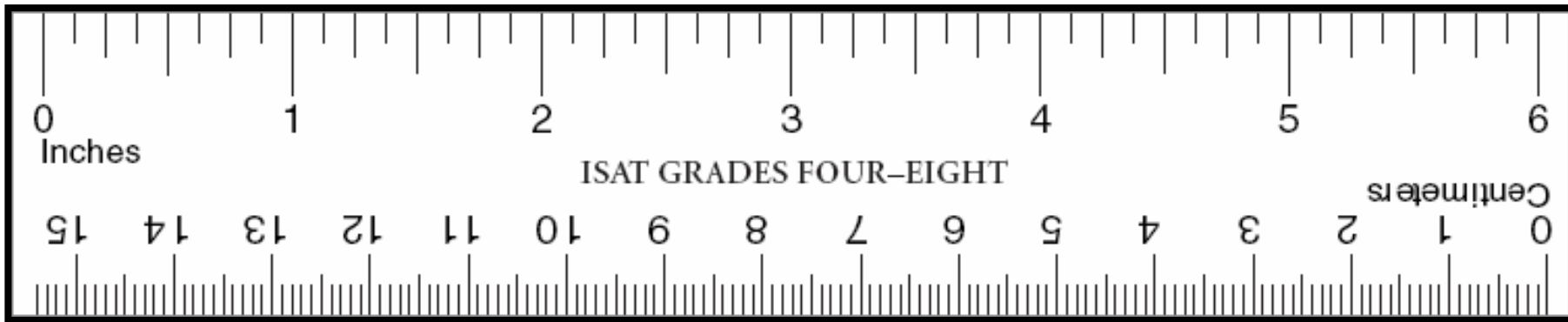
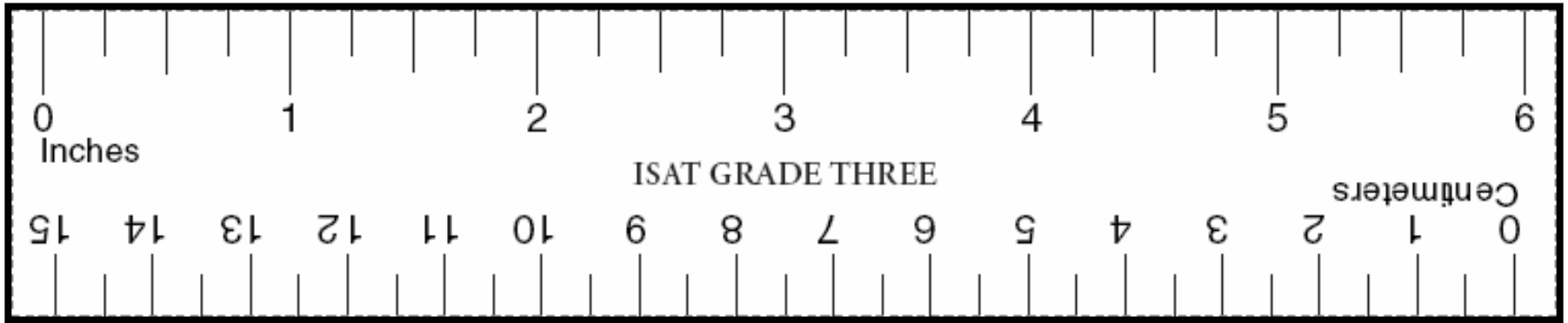
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- Item formats: Multiple Choice (MC), Short Response (SR), Extended Response (ER)
- Pilot items within the test
- Four answer choices for MC at all grades
- Three 45-minute\* sessions
- Rulers at all grades
- Calculator use is *allowed* in grades 4-8
- Reference sheet for grades 7-8

\* Plus up to 10 additional minutes for all students



# Rulers (Grades 3-8)



# Reference Sheet

(Grades 7-8)

## ISAT MATHEMATICS REFERENCE SHEET Grades 7 and 8

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### FORMULAS FOR PLANE FIGURES

Parallelogram:  $A = bh$

Trapezoid:  $A = \frac{1}{2}(b_1 + b_2)h$

Triangle:  $A = \frac{1}{2}bh$

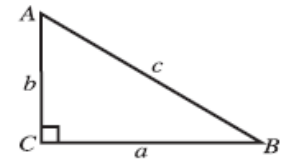
Circle:  $C = 2\pi r$

$$A = \pi r^2$$

Right Triangle:

The Pythagorean Formula

$$c^2 = a^2 + b^2$$



---

### FORMULAS FOR SOLID FIGURES

Prism:  $V = Bh$  ( $B$  is the area of the base.)


Right Cylinder:  $V = \pi r^2 h$

Regular Pyramid:  $V = \frac{1}{3}Bh$

# Reporting

## Illinois Student Report Summary

(Page 1)



ILLINOIS STANDARDS ACHIEVEMENT TEST (ISAT)

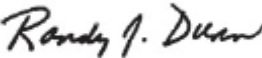
**Spring 2006 Results For:**  
**FirstName LastName**

School: **Sample SchoolName**  
 District: **Sample DistrictName**  
 School Code: **RCDS**

**This template will be used for grades 4 and 7.**

This report provides specific information about the student's performance on the Illinois Standards Achievement Test (ISAT) in Reading, Mathematics, and Science. It also includes information for teachers and parents/guardians about how to support student learning. The ISAT is only one indication of how well students do in each subject tested. It is also important to consider how well students are doing on class work, special projects, and assessments other than the ISAT.






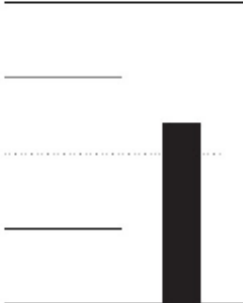
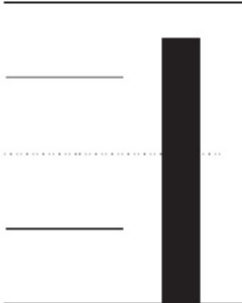
For further information, visit the Illinois State Board of Education online at [www.isbe.net](http://www.isbe.net)



STATE SUPERINTENDENT  
 ILLINOIS STATE BOARD OF EDUCATION

### Student's Scores and Performance Levels

In the charts below, you will see the student's scale scores and performance levels in reading, mathematics, and science. The scale score is the numerical score the student received on each test. The performance level shows how the student performed in relation to the Illinois Learning Standards.

	Reading	Mathematics	Science
 Exceeds Standards  Meets Standards  Below Standards  Academic Warning	 <p>The student's scale score in reading is _____ which is at the <b>Below Standards</b> performance level.</p>	 <p>The student's scale score in mathematics is _____ which is at the <b>Meets Standards</b> performance level.</p>	 <p>The student's scale score in science is _____ which is at the <b>Exceeds Standards</b> performance level.</p>

**About Performance Levels**

- **Exceeds Standards**  
 Student work demonstrates advanced knowledge and skills in the subject. Students creatively apply knowledge and skills to solve problems and evaluate the results.
- **Meets Standards**  
 Student work demonstrates proficient knowledge and skills in the subject. Students effectively apply knowledge and skills to solve problems.
- **Below Standards**  
 Student work demonstrates basic knowledge and skills in the subject. However, because of gaps in learning, students apply knowledge and skills in limited ways.
- **Academic Warning**  
 Student work demonstrates limited knowledge and skills in the subject. Because of major gaps in learning, students apply knowledge and skills ineffectively.

# Reporting

## Illinois Student Report Reading Results

(Page 2)

### More about the Reading score for [FirstName] [LastName]

The student scored overall at the **Below Standards** level in Reading.

#### Multiple-Choice Results for Reading

The table below shows how the student performed (number correct) on the multiple-choice items for standards assessed in reading. The total number of items and the average number correct for the school, district, and state are also displayed.

Reading Standards Assessed	Number Correct	Number of Items	Average Number Correct		
			School	District	State
1A: Vocabulary Development					
1B: Reading Strategies					
1C: Reading Comprehension					
2A, 2B: Literature					

#### Extended-Response Results for Reading

The table to the right shows how the student performed on the extended-response item in reading. Extended-response items require students to read a passage and write a response to a question about the passage.

The extended-response item is scored on a scale from 0 to 4, with 4 being the highest score. The student's score is shown in the first column of the table. The percent of responses that received a 4, 3, 2, 1, and 0 is shown for the school, district, and state.

#### Reading Passage Description

Reading Passage Description	Student Score	Score Range	% of Responses for Each Score		
			School	District	State
These items assess how well the student answers the prompt by discussing key ideas, making connections or drawing conclusions, and extending and balancing ideas.	4				
	3				
	2				
	1				
	0				

### Use the student's Lexile<sup>®</sup> score to find books

#### How do I know what books are right for this student?

The skill level of both readers and texts is measured with Lexiles<sup>®</sup>. Use the student's Lexile measure to help choose books that will encourage reading progress.

**790L** The student's Lexile score

**690L-790L** For leisure reading, the student will find most books in this range easy to understand.

**790L-840L** Books in this range provide a manageable but stimulating challenge.

#### Where can I find the right books for this student?

Visit [www.Lexile.com](http://www.Lexile.com)

- 1 On the home page, click Educators.
  - 2 Click Lexile Book Database.
  - 3 Search for books by Lexile range, keyword, title, author, or ISBN.
- You will also find a Lexile Calculator, a Lexile Analyzer, and Lexile Resource Kits on the Educators page.

#### Take the student's Lexile scores to your local library

The librarian can help you find books within the student's Lexile range. Remember to consider all factors when choosing text for the student, including his or her interests and your views on what is age-appropriate material.

# Reporting

## Illinois Student Report Mathematics Results

(Page 3)

### More about the Mathematics score for [FirstName] [LastName]

The student scored overall at the **Meets Standards** level in Mathematics.

#### Multiple-Choice Results for Mathematics

The table below shows how the student performed (number correct) on the multiple-choice items for standards assessed in mathematics. The total number of items and the average number correct for the school, district, and state are also displayed.

Mathematics Standards Assessed	Number Correct	Number of Items	Average Number Correct		
			School	District	State
<b>6A, 6B, 6C, 6D:</b> Number Sense					
<b>7A, 7B, 7C:</b> Measurement					
<b>8A, 8B, 8C, 8D:</b> Algebra					
<b>9A, 9B:</b> Geometry					
<b>10A, 10B, 10C:</b> Data Analysis, Statistics, and Probability					

#### Short-Response Results for Mathematics

The table below shows how the student performed on the short-response items in mathematics. Short-response items require students to write a response to a mathematics item.

Score Descriptions	Item 1 Description			Item 2 Description		
	Student Score	Score Range	% of Responses for Each Score School District State	Student Score	Score Range	% of Responses for Each Score School District State
2= Completely correct response		2		2		
1= Partially correct response		1		1		
0= Incorrect or no response		0		0		

#### Extended-Response Results for Mathematics

The table to the right shows how the student performed on the extended-response item in mathematics. Extended-response items require students to write a response to a mathematics item that includes the correct answer, evidence of a strategy, and an explanation in words addressing what they did and why they took the steps they did to solve the problem.

The extended-response item is scored on a scale from 0 to 4, with 4 being the highest score in each category: Mathematical Knowledge, Strategic Knowledge, and Explanation. The student's score is shown in the first column of the table. The percent of responses that received a 4, 3, 2, 1, and 0 is shown for the school, district, and state.

Item Description	Student Score	Score Range	% of Responses for Each Score		
			School	District	State
<b>Mathematical Knowledge</b> Knowledge of mathematical principles and concepts that result in a correct solution to a problem.		4			
		3			
		2			
		1			
		0			
<b>Strategic Knowledge</b> Identification of important problem elements and the use of models, and/or algorithms to systematically represent and integrate concepts.		4			
		3			
		2			
		1			
		0			
<b>Explanation</b> Written explanation and rationales that translate into words the steps of the solution process and provide a justification for each step.		4			
		3			
		2			
		1			
		0			

# Reporting

## Illinois Student Report Science Results & National Comparisons

(Page 4)

### More about the Science score for [FirstName] [LastName]

The student scored overall at the **Exceeds Standards** level in Science.

#### Multiple-Choice Results for Science

The table below shows how the student performed (number correct) on the multiple-choice items for standards assessed in science. The total number of items and the average number correct for the school, district, and state are also displayed.

Science Standards Assessed	Number Correct	Number of Items	Average Number Correct		
			School	District	State
<b>11A, 11B:</b> Scientific Inquiry and Technological Design					
<b>12A, 12B:</b> Life Science and Environmental Sciences					
<b>12C, 12D:</b> Matter, Energy, and Forces					
<b>12E, 12F:</b> Earth and Space Sciences					
<b>13A, 13B:</b> Safety, Practices of Science, Science/Technology/Society, and Measurement					

### National Comparisons

#### How did the student perform compared to other students?

The student's national percentile rank indicates how the student's performance compares to others in the same grade. For example, a percentile rank of 75 means that the student scored as well as or better than 75% of the tested students in the nation.

#### Reading

Student's National Percentile Rank	<b>68</b>
------------------------------------	-----------

In reading, the student did as well or better than 68% of students nationally.

#### Support Reading

Reading at home helps students improve in school. Be aware of the student's Lexile scores and encourage them to find books within their Lexile range. Consider the student's interests when choosing texts.

#### Mathematics

Student's National Percentile Rank	<b>72</b>
------------------------------------	-----------

In mathematics, the student did as well or better than 72% of students nationally.

#### Support Mathematics

Help students identify and explore mathematics in everyday activities so the study of mathematics becomes meaningful. Allow them to engage in projects that involve measurement, and encourage them to develop problem solving by asking questions and exploring patterns.

#### Science

Student's National Percentile Rank	<b>91</b>
------------------------------------	-----------

In science, the student did as well or better than 91% of students nationally.

#### Support Science

Children are naturally curious about the world, so encourage them to ask questions. Train them to use all of their senses to make science investigations at home and at school. Encourage them to search for answers as they study the life, physical, and earth sciences.



# Assessment Objectives

## Mathematics – State Goal 6: Number Sense

	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
<b>Standard 6A – Representations and Ordering</b>						
	Calculators Not Allowed	Calculators Allowed	Calculators Allowed	Calculators Allowed	Calculators Allowed	Calculators Allowed
	6.3.01 Read, write, recognize, and model equivalent representations of whole numbers and their place values up to 100,000.	6.4.01 Read, write, recognize, and model equivalent representations of whole numbers and their place values up to 1,000,000.	6.5.01 Read, write, recognize, and model equivalent representations of whole numbers and their place values up to 100,000,000.	6.6.01 Read, write, recognize, and model equivalent representations of whole numbers and their place values.	6.7.01 Read, write, and recognize equivalent representations of positive powers of 10.	6.8.01 Read, write, and recognize equivalent representations of integer powers of 10.

## Mathematics – State Goal 7: Measurement

	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
<b>Standards 7A, 7B, 7C – Units, Tools, Estimation, and Applications</b>						
	Calculators Not Allowed	Calculators Allowed	Calculators Allowed	Calculators Allowed	Calculators Allowed	Calculators Allowed
Elapsed Time	7.3.01 Solve problems involving simple elapsed time in compound units (e.g., hours, minutes, days).	7.4.01 Solve problems involving elapsed time in compound units (e.g., 1 hour and 40 minutes) that occur in the same half day (a.m. only or p.m. only).	7.5.01 Solve problems involving elapsed time in compound units.			
Measurement Tools	7.3.02 Select and use appropriate standard units and tools to measure length (to the nearest inch or cm), time (to the nearest minute), and temperature (to the nearest degree).	7.4.02 Select and use appropriate standard units and tools to measure length (to the nearest $\frac{1}{4}$ inch or $\frac{1}{2}$ cm), time, and temperature.	7.5.02 Select and use appropriate standard units and tools to measure length (to the nearest $\frac{1}{4}$ inch or mm), mass/weight, capacity, and angles.	7.6.01 Select and use appropriate standard units and tools to measure length, mass/weight, capacity, and angles.	7.7.01 Select and use appropriate standard units and tools to measure length, mass/weight, capacity, and angles. Sketch, with given specifications, line segments, angles, triangles, and quadrilaterals.	7.8.01 Select and use appropriate standard units and tools to solve measurement problems, including measurements of polygons and circles.



# Item Analysis Summary - NEWTOWN ELEMENTARY

DISTRICT: NEWTOWN  
RCDTS CODE: 123456789012345

GRADE: 03  
TEST DATE: 03/06

MATHEMATICS			RESPONSE ANALYSIS (% CORRECT)		
Results from Multiple-Choice Items	# of Items	Assessment Objective	SCHOOL	DISTRICT	STATE
State Goal 6: Number Sense Standard 6A: Representations and Ordering	24				
	10				
	1	6.3.01			
	1	6.3.02			
	1	6.3.03			
	2	6.3.04			
	1	6.3.05			
	1	6.3.06			
	1	6.3.07			
	2	6.3.08			
Standards 6B, 6C: Computation, Operations, Estimation, and Properties	14				
	3	6.3.09			
	4	6.3.10			
	2	6.3.11			
	3	6.3.12			
	1	6.3.13			
	1	6.3.14			
Standard 6D: Ratios, Proportions, and Percents	0				
State Goal 7: Measurement Standards 7A, 7B, 7C: Units, Tools, Estimation, and Applications	13				
	13				
	4	7.3.01			
	2	7.3.02			
	1	7.3.03			
	1	7.3.04			
	2	7.3.05			
	2	7.3.06			
	1	7.3.07			
State Goal 8: Algebra Standard 8A: Representations, Patterns, and Expressions	6				
	4				
	2	8.3.01			
	2	8.3.02			
Standard 8B: Connections Using Tables, Graphs, and Symbols	0				
Standards 8C, 8D: Writing, Interpreting, and Solving Equations	2				
	1	8.3.03			
	1	8.3.05			



# Item Analysis Summary - NEWTOWN ELEMENTARY

DISTRICT: NEWTOWN  
RCDTS CODE: 123456789012345

GRADE: 03  
TEST DATE: 03/06

MATHEMATICS			RESPONSE ANALYSIS (% CORRECT)		
Results from Multiple-Choice Items (cont.)	# of Items	Assessment Objective	SCHOOL	DISTRICT	STATE
State Goal 9: Geometry	13				
Standard 9A: Properties of Single Figures and Coordinate Geometry	9				
	1	9.3.01			
	2	9.3.02			
	2	9.3.03			
	1	9.3.04			
	2	9.3.05			
	1	9.3.06			
Standard 9B: Relationships Between and Among Multiple Figures	4				
	1	9.3.08			
	2	9.3.09			
	1	9.3.11			
Standard 9C: Justifications of Conjectures and Conclusions	0				
Standard 9D: Trigonometry	0				
State Goal 10: Data Analysis, Statistics, and Probability	9				
Standards 10A, 10B: Data Analysis and Statistics	5				
	3	10.3.01			
	1	10.3.02			
	1	10.3.03			
Standard 10C: Probability	4				
	2	10.3.04			
	2	10.3.05			




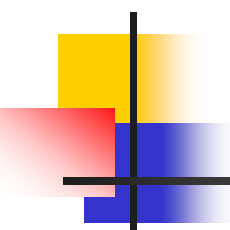
# Item Analysis Summary - NEWTOWN ELEMENTARY

DISTRICT: NEWTOWN  
RCDTS CODE: 123456789012345

GRADE: 03  
TEST DATE: 03/06

MATHEMATICS			RESPONSE ANALYSIS (% AT EACH SCORE POINT)		
Results from Short-Response Items 2 = Completely correct response 1 = Partially correct response 0 = Incorrect or no response	Score Range	Assessment Objective	SCHOOL	DISTRICT	STATE
<b>Item 1</b> <b>State Goal 9: Geometry</b> Standard 9A: Properties of Single Figures and Coordinate Geometry Students are given four shapes and must identify the two shapes that are symmetrical by drawing the line of symmetry on each.	2 1 0	9.3.04			
<b>Item 2</b> <b>State Goal 10: Data Analysis, Statistics, and Probability</b> Standards 10A, 10B: Data Analysis and Statistics Students must interpret where items belong in a Venn diagram with two circles.	2 1 0	10.3.01			
<b>State Goal 8: Algebra</b> Standards 8C, 8D: Writing, Interpreting, and Solving Equations Students must determine one way that 14 books can be distributed among three classrooms and the school library, given that each classroom must receive the same number of books.		8.3.05			
<b>Mathematical Knowledge</b> Knowledge of mathematical principles and concepts that result in a correct solution to a problem.	4 3 2 1 0				
<b>Strategic Knowledge</b> Identification of important problem elements and the use of models, and/or algorithms to systematically represent and integrate concepts.	4 3 2 1 0				
<b>Explanation</b> Written explanation and rationales that translate into words the steps of the solution process and provide a justification for each step.	4 3 2 1 0				

# Grade 3 Multiple-Choice Sample from 2006 ISAT



Which of the following has exactly one vertex?

- Ⓐ Cube
- Ⓑ Cone
- Ⓒ Square Pyramid
- Ⓓ Rectangular Prism

**Standard 9A: Properties of Single Figures and Coordinate Geometry**  
**Assessment Objective: 9.3.02**

Identify and describe three-dimensional shapes (cubes, spheres, cones, cylinders, prisms, and pyramids) according to their characteristics (faces, edges, vertices).

# Grade 4 Multiple-Choice Sample from 2006 ISAT

Which number sentence is true?

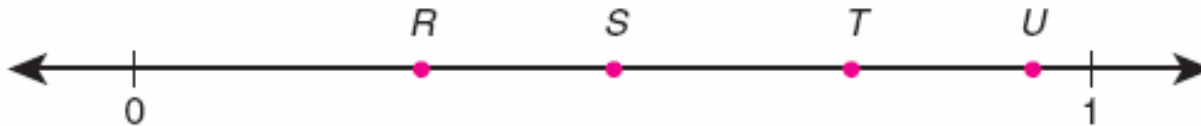
- A**  $15 \times 3 = (10 \times 3) \div (5 \times 3)$
- B**  $15 \times 3 = (10 \times 3) \times (5 \times 3)$
- C**  $15 \times 3 = (10 \times 3) - (5 \times 3)$
- D**  $15 \times 3 = (10 \times 3) + (5 \times 3)$

**Standards 6B, 6C: Computation, Operations, Estimation, and Properties**  
**Assessment Objective: 6.4.14**

Solve problems involving the commutative and distributive properties of operations on whole numbers [e.g.,  $8 + 7 = 7 + 8$ ,  $27 \times 5 = (20 \times 5) + (7 \times 5)$ ].

# Grade 5 Multiple-Choice Sample from 2006 ISAT

Which letter on the number line below best represents the location of  $\frac{3}{4}$ ?



**A** R

**B** S

**C** T

**D** U

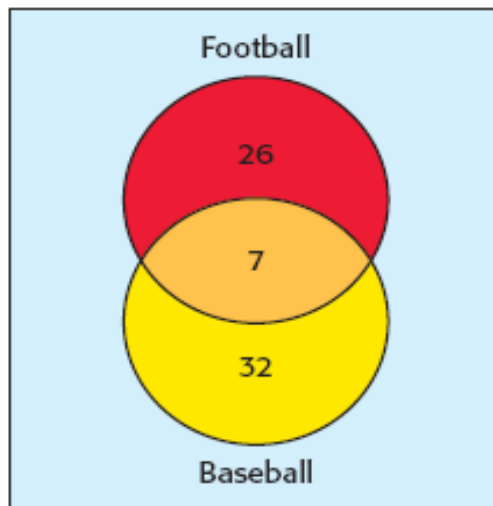
**Standard 6A: Representations and Ordering**

**Assessment Objective: 6.5.10**

Identify and locate whole numbers, halves, fourths, and thirds on a number line.

# Grade 6 Multiple-Choice Sample from 2006 ISAT

The Venn diagram below shows the number of students at Washington Elementary who play baseball and football.



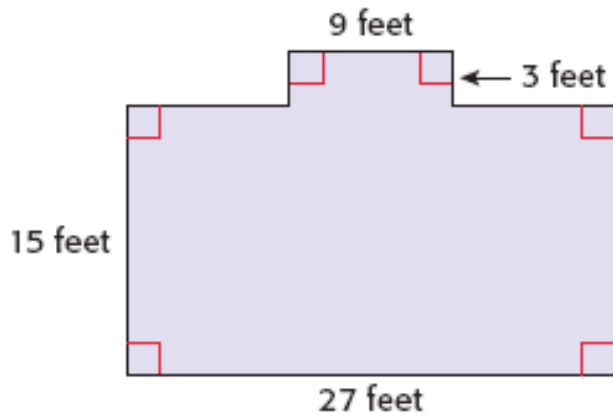
How many students play baseball but *not* football?

- 39      33      32      26  
**A**      **B**      **C**      **D**

**Standards 10A, 10B:**  
**Data Analysis and Statistics**

**Assessment Objective: 10.6.01**  
Read, interpret, and make predictions from data represented in a bar graph, line (dot) plot, Venn diagram (with two circles), chart/table, line graph, or circle graph.

# Grade 7 Multiple-Choice Sample from 2006 ISAT



What is the area, in square feet,  
of the polygon shown above?

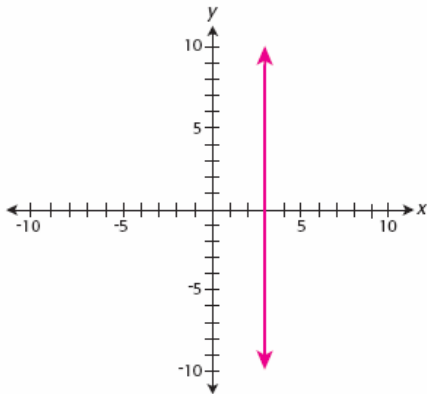
- A** 90 square feet
- B** 144 square feet
- C** 405 square feet
- D** 432 square feet

**Standards 7A, 7B, 7C:**  
**Units, Tools, Estimation, and  
Applications**

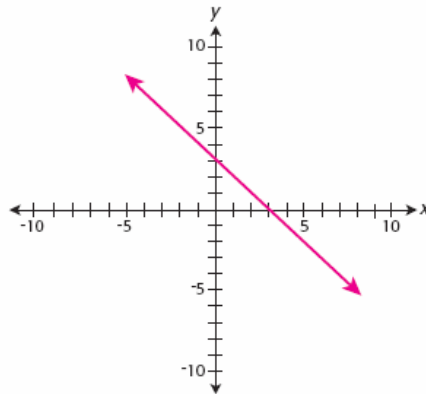
**Assessment Objective: 7.7.02**  
Solve problems involving the  
perimeter and area of polygons  
and composite figures using  
diagrams, models, and grids or by  
measuring or using given  
formulas (may include sketching a  
figure from its description).

# Grade 8 Multiple-Choice Sample from 2006 ISAT

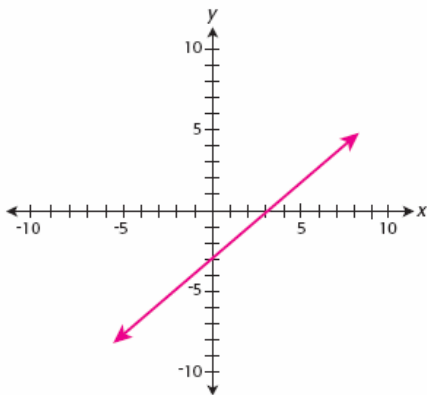
Which represents the graph of  $y = 3$ ?



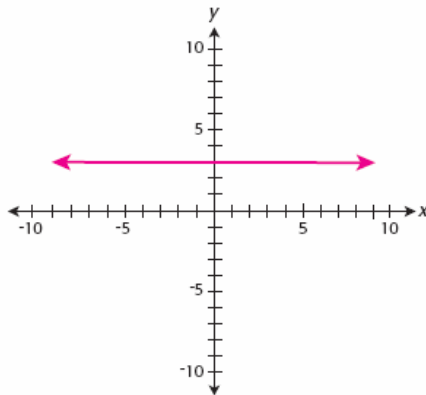
**A**



**C**



**B**



**D**

**Standard 8B:**  
**Connections Using Tables,  
Graphs, and Symbols**

**Assessment Objective: 8.8.07**  
Represent linear equations and  
quantitative relationships on a  
rectangular coordinate system, and  
interpret the meaning of a specific  
part of a graph.



# Short and Extended Response

---

- Short- and Extended-Response items are scored using a rubric.  
([www.isbe.net/assessment/math.htm](http://www.isbe.net/assessment/math.htm))
  - Item-specific rubrics are developed for each item before scoring.
- The 2 short-response items will contribute 5% to the scale score.
- The 1 extended-response item will contribute 10% to the scale score.

## MATHEMATICS SCORING RUBRIC: A GUIDE TO SCORING SHORT-RESPONSE ITEMS

*Note: Item-specific rubrics are developed for each item before scoring.*

Score  
Level

**2** ♦ Completely correct response, including correct work shown and/or correct labels/units if called for in the item

---

**1** ♦ Partially correct response

---

**0** ♦ No response, or the response is incorrect

---

**MATHEMATICS SCORING RUBRIC**  
The following rubric is used for the short-response items for grade levels 3 through 8.

**MATHEMATICS SCORING RUBRIC: A GUIDE TO SCORING EXTENDED-RESPONSE ITEMS**

The following rubric is used for the extended-response items for grade levels 3 through 8.

**MATHEMATICS SCORING RUBRIC**

	<b>MATHEMATICAL KNOWLEDGE:</b> Knowledge of mathematical principles and concepts which result in a correct solution to a problem.	<b>STRATEGIC KNOWLEDGE:</b> Identification and use of important elements of the problem that represent and integrate concepts which yield the solution (e.g., models, diagrams, symbols, algorithms).	<b>EXPLANATION:</b> Written explanation of the rationales and steps of the solution process. A justification of each step is provided. Though important, the length of the response, grammar, and syntax are not the critical elements of this dimension.
<b>Score Level</b>			
<b>4</b>	<ul style="list-style-type: none"> <li>♦ shows complete understanding of the problem's mathematical concepts and principles</li> <li>♦ uses appropriate mathematical terminology and notations including labeling answer if appropriate</li> <li>♦ executes algorithms and computations completely and correctly</li> </ul>	<ul style="list-style-type: none"> <li>♦ identifies all important elements of the problem and shows complete understanding of the relationships among elements</li> <li>♦ shows complete evidence of an appropriate strategy that would correctly solve the problem</li> </ul>	<ul style="list-style-type: none"> <li>♦ gives a complete written explanation of the solution process; clearly explains <u>what</u> was done and <u>why</u> it was done</li> <li>♦ may include a diagram with a complete explanation of all its elements</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>♦ shows nearly complete understanding of the problem's mathematical concepts and principles</li> <li>♦ uses mostly correct mathematical terminology and notations</li> <li>♦ executes algorithms completely; computations are generally correct but may contain minor errors</li> </ul>	<ul style="list-style-type: none"> <li>♦ identifies most important elements of the problem and shows a general understanding of the relationships among them</li> <li>♦ shows nearly complete evidence of an appropriate strategy for solving the problem</li> </ul>	<ul style="list-style-type: none"> <li>♦ gives a nearly complete written explanation of the solution process; clearly explains <u>what</u> was done and begins to address <u>why</u> it was done</li> <li>♦ may include a diagram with most of its elements explained</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>♦ shows some understanding of the problem's mathematical concepts and principles</li> <li>♦ uses some correct mathematical terminology and notations</li> <li>♦ may contain major algorithmic or computational errors</li> </ul>	<ul style="list-style-type: none"> <li>♦ identifies some important elements of the problem but shows only limited understanding of the relationships among them</li> <li>♦ shows some evidence of a strategy for solving the problem</li> </ul>	<ul style="list-style-type: none"> <li>♦ gives some written explanation of the solution process; either explains <u>what</u> was done or addresses <u>why</u> it was done</li> <li>♦ explanation is vague, difficult to interpret, or does not completely match the solution process</li> <li>♦ may include a diagram with some of its elements explained</li> </ul>
<b>1</b>	<ul style="list-style-type: none"> <li>♦ shows limited to no understanding of the problem's mathematical concepts and principles</li> <li>♦ may misuse or fail to use mathematical terminology and notations</li> <li>♦ attempts an answer</li> </ul>	<ul style="list-style-type: none"> <li>♦ fails to identify important elements or places too much emphasis on unrelated elements</li> <li>♦ reflects an inappropriate strategy for solving the problem; strategy may be difficult to identify</li> </ul>	<ul style="list-style-type: none"> <li>♦ gives minimal written explanation of the solution process; may fail to explain <u>what</u> was done and <u>why</u> it was done</li> <li>♦ explanation does not match presented solution process</li> <li>♦ may include minimal discussion of the elements in a diagram; explanation of significant elements is unclear</li> </ul>
<b>0</b>	<ul style="list-style-type: none"> <li>♦ no answer attempted</li> </ul>	<ul style="list-style-type: none"> <li>♦ no apparent strategy</li> </ul>	<ul style="list-style-type: none"> <li>♦ no written explanation of the solution process is provided</li> </ul>



# Short- and Extended-Response Items

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- Short- and Extended-Response items are only different item formats, they do not define the content. The content is defined in the Illinois Mathematics Assessment Framework.
- Directions for how students are to respond will be given in the item itself (e.g., show your work, label your answer).
- Use previous year's released ISAT short- and extended-response sample items from grades 3 through 8 to practice this format.

# Short-Response Sample Question and Answer from Test Booklet

## SAMPLE SHORT-RESPONSE QUESTION

Sam can buy his lunch at school. Each day, he wants to buy juice that costs 50¢, a sandwich that costs 90¢, and fruit that costs 35¢.

Exactly how much money does Sam need to buy lunch for 5 days?

Show your work and label your answer.

## SAMPLE SHORT-RESPONSE ANSWER

$$50¢ + 90¢ + 35¢ = \$1.75$$

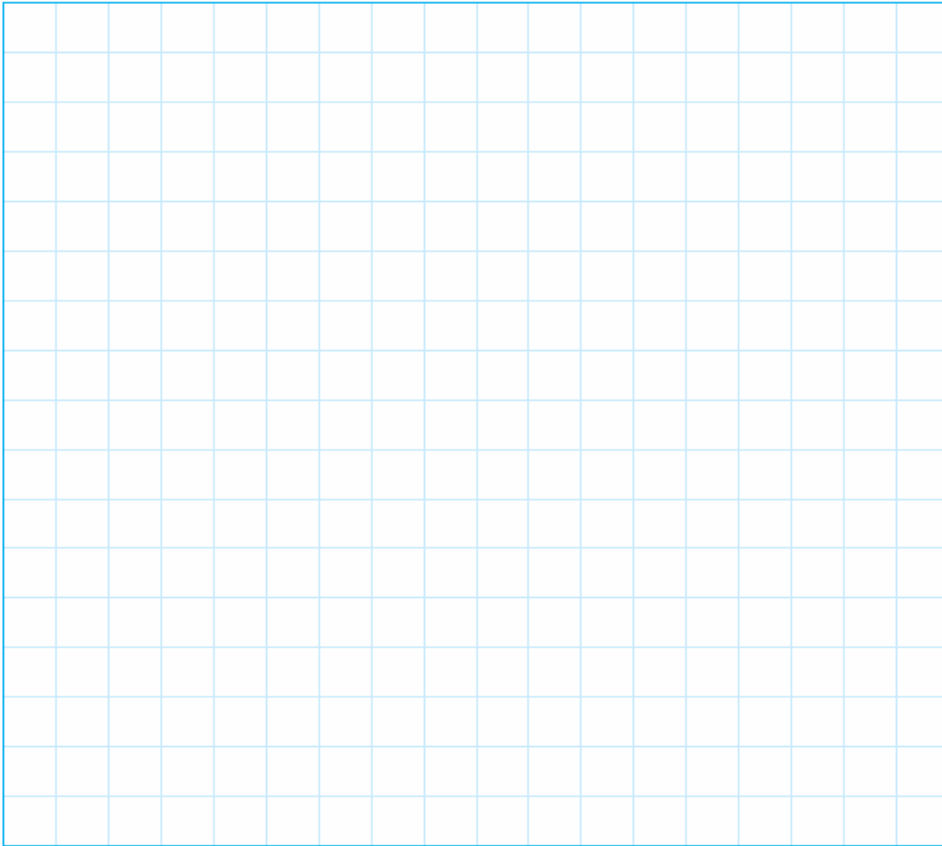
for each day

My answer  
\$8.75

$$\begin{array}{r} \phantom{+} 1.75 \\ \phantom{+} 1.75 \\ \phantom{+} 1.75 \\ \phantom{+} 1.75 \\ \phantom{+} 1.75 \\ \hline + 1.75 \\ \hline \$8.75 \text{ for five days} \end{array}$$

## Mathematics - Session 2

Write your response to question 71 in the space below.



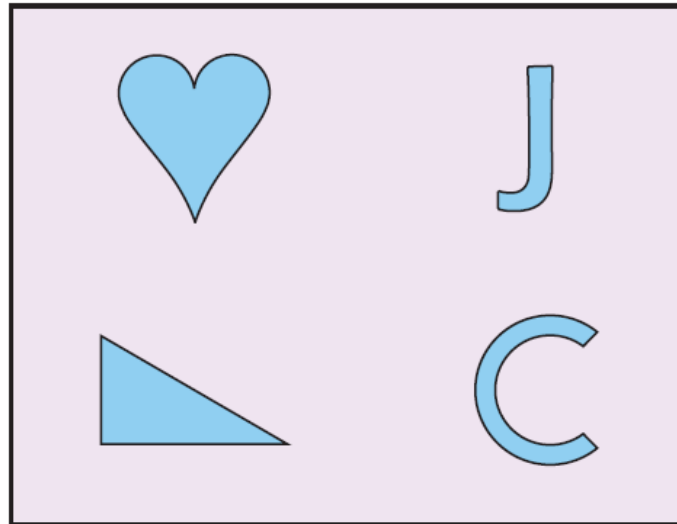
The answer space for each short-response item is 1 page, and it has faint grid lines.

These grid lines may help students if the item requires them to show work.

# Grade 3 Short-Response Sample from 2006 ISAT

Two of the four shapes below have exactly one line of symmetry.

Draw the line of symmetry on those two shapes.



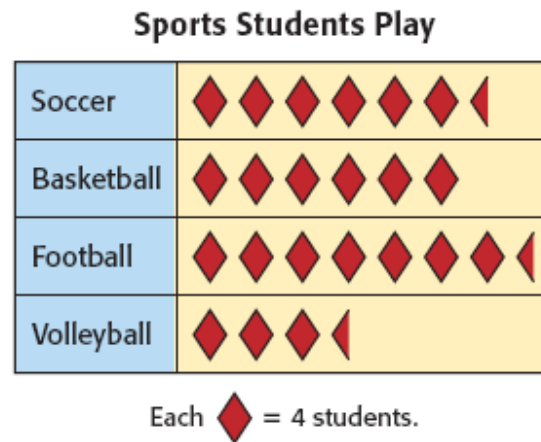
**Standard 9A: Properties of Single Figures and Coordinate Geometry**

**Assessment Objective: 9.3.04**

Identify whether or not a figure has a line of symmetry, and sketch or identify the line of symmetry.

# Grade 4 Short-Response Sample from 2006 ISAT

Using the graph below, how many more students play football than basketball?  
Show your work.



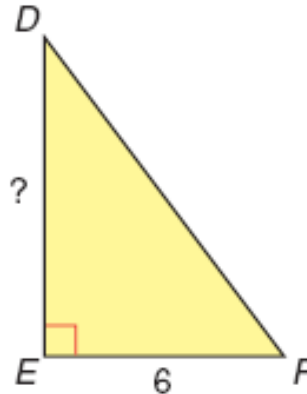
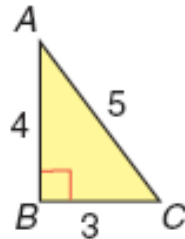
**Standards 10A, 10B: Data Analysis and Statistics**

**Assessment Objective: 10.4.01**

Read and interpret data represented in a pictograph, bar graph, line (dot) plot, Venn diagram (with two circles), tally chart, table, line graph, or circle graph.

# Grade 5 Short-Response Sample from 2006 ISAT

Triangle  $ABC$  is similar to triangle  $DEF$ .



Find the measure of  $\overline{DE}$ . Show your work.





**Standard 9B: Relationships Between and Among Multiple Figures**

**Assessment Objective: 9.5.14**

Determine if figures are similar, and identify relationships between corresponding parts of similar figures.

# Grade 6 Short-Response Sample from 2006 ISAT

Using toothpicks, Julio made a pattern of equilateral triangles. He recorded the number of triangles made and the number of toothpicks used in a chart.

					
Number of Triangles Made	1	2	3	4	5
Number of Toothpicks Used	3	5	7	9	11

Using this chart, how many toothpicks would Julio use to make a figure with 10 equilateral triangles?

Show your work.

## Standard 8A: Representations, Patterns, and Expressions


### Assessment Objective: 8.6.01

Determine a missing term in a sequence, extend a sequence, and construct and identify a rule that can generate the terms of a given sequence (e.g., 3, 6, 9, . . . is explained by the rule  $3n$ , for  $n \geq 1$ ).



# Grade 7 Short-Response Sample from 2006 ISAT

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On March 1, Jess had 1,000 monthly minutes to use with her cellular phone plan. She uses 39 minutes per day during March.

On what date will she run out of minutes?

Show your work.


**Standards 6B, 6C: Computation, Operations, Estimation, and Properties**  
**Assessment Objective: 6.7.12**

Make estimates appropriate to a given situation, and analyze what effect the estimation method used has on the accuracy of results.



# Grade 8 Short-Response Sample from 2006 ISAT

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Using your centimeter ruler, draw a rectangle with a perimeter of 24 centimeters.  
Label the length and width.

**Standards 7A, 7B, 7C: Units, Tools, Estimation, and Applications**



**Assessment Objective: 7.8.02**

Solve problems involving perimeter/circumference and area of polygons, circles, and composite figures using diagrams, models, and grids or by measuring or using given formulas (may include sketching a figure from its description).



# Additional Samples of Short-Response Items from NAEP

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- Go to <http://nces.ed.gov/nationsreportcard/>
- On the top of the page, select "SAMPLE QUESTIONS"
- Click on  to begin using the NAEP Questions Tool.
- Scroll down to "Advanced Search" and select "Mathematics" from the drop-down menu
- Click 

▼ ABOUT NAEP...

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NAEP QUESTIONS

NAEP DATA

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PUBLICATIONS

# NAEP Questions

The Nation's Report Card (home)

[Tool Help](#)

## Advanced Search Options

In 2005, NAEP mathematics items were reclassified according to new specifications in NAGB's 2005 mathematics framework. A description of the changes is available under the "Subject Information" link in the Questions Tool and in "What the Assessment Measures" on the main subject pages of this website.

Subject **Mathematics**

Grade

Mathematical Content Area<sup>1</sup>

Question Type

Mathematical Complexity<sup>2</sup>

Mathematical Ability<sup>3</sup>

Question Difficulty

# NAEP Questions

The Nation's Report Card (home)

[Tool Help](#)

← Question 11 of 153 →

 [To Print Folder: Empty](#)

 [Add Question](#)

Subject: **Mathematics** [ [Subject Info](#) ] Grade: **4** Block: **2003-4M10** No.: **5**

Description: **Write a multiplication number sentence**

Question \ [Performance Data](#) \ [Content Classification](#) \ [Scoring Guide/Key](#) \ [Student Responses](#) \ [More Data](#) \

[Printable Version](#)

5. Kim wants to give 7 stickers to each of her 5 friends. To find out how many stickers she needs, she writes the number sentence  $7 + 7 + 7 + 7 + 7 = \square$ .

Write a number sentence with multiplication that she could use to find the number of stickers she needs.



# Short- and Extended-Response Samples

Released Short- and Extended-Response Items from the Mathematics ISAT	
Grade Level	Year
Grade 3	2006
Grade 4	2006
Grade 5	2006
Grade 6	2006
Grade 7	2006
Grade 8	2006

Released Extended-Response Items from the Mathematics ISAT							
Grade Level	Year						
Grade 3	1999	2000	2001	2002	2003	2004	2005
Grade 5	1999	2000	2001	2002	2003	2004	2005
Grade 8	1999	2000	2001	2002	2003	2004	2005
Grade 10	1999	2000	n/a	n/a	n/a	n/a	n/a

# Extended Response Sample Question and Answer from Test Booklet

## SAMPLE EXTENDED-RESPONSE PROBLEM

Mrs. Martin wants to put tiles on the floor by the front door of her house. She wants to use 3 different colors of tiles in her design.

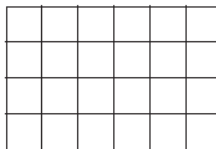
She also wants

$\frac{1}{2}$  of the tiles to be blue,

$\frac{1}{4}$  of the tiles to be gray, and

$\frac{1}{4}$  of the tiles to be red.

Use the grid below to design a floor for Mrs. Martin. Label each tile with the first letter of the color that should be placed there.



Show all your work. Explain in words how you found your answer. Tell why you took the steps you did to solve the problem.

## SAMPLE EXTENDED-RESPONSE SOLUTION

B	B	B	B	B	B	} $\frac{1}{2}$ blue
B	B	B	B	B	B	
G	G	G	G	G	G	← $\frac{1}{4}$ gray
R	R	R	R	R	R	← $\frac{1}{4}$ red

First, I know that there are 4 equal rows, so 2 rows is half and 1 row is  $\frac{1}{4}$ . So I made 2 rows B for blue because she wants half the tiles blue. Then I made 1 row G for gray because she wants  $\frac{1}{4}$  of the tiles to be gray. Since she wants gray and red to be the same amount of tiles, I made the last row R for red.

## Mathematics - Session 3

**DIRECTIONS** Write your response to problem 74 on pages 16 and 17.

Make sure you

- show all your work in solving the problem,
- clearly label your answer,
- tell in words how you solved the problem,
- tell in words why you took the steps you did to solve the problem, and
- write as clearly as you can.

IL06-11

16

GO ON ►

00000 16

## Mathematics - Session 3

IL06-11


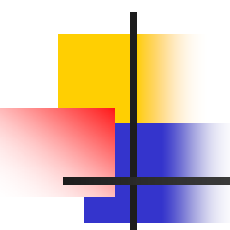
17

GO ON ►

00000 17

The answer space for each extended-response item is 2 pages. Page 1 has a blank space, and page 2 has faint grid lines.

# Grade 3 Extended-Response Sample from 2006 ISAT



The owner of a bookstore gave 14 books to a school. The principal will give an equal number of books to each of 3 classrooms and the remaining books to the school library.

How many books could the principal give each classroom and the school library?

Show all your work in the space below and on the next page. Explain in words how you found your answer. Tell why you took the steps you did to solve the problem.

**Standards 8C, 8D: Writing, Interpreting, and Solving Equations**

**Assessment Objective: 8.3.05**

Solve word problems involving unknown quantities.

# Grade 4 Extended-Response Sample from 2006 ISAT

The zookeeper wants to build a new area for a petting zoo using the following rules:

- The petting zoo must be in the shape of a polygon with an *even* number of sides.
- The perimeter of the petting zoo should be 100 feet.

Draw a picture of a petting zoo that the zookeeper could build using the above rules. Label the length of each side of your petting zoo.

Show all your work. Explain in words how you found your answer. Tell why you took the steps you did to solve the problem.

**Standards 7A, 7B, 7C: Units, Tools, Estimation, and Applications**

**Assessment Objective: 7.4.03**

Solve problems involving the perimeter of a polygon with given side lengths and the area of a square, rectangle, or irregular shape composed of rectangles using diagrams, models, and grids or by measuring (may include sketching a figure from its description).

# Grade 5 Extended-Response Sample from 2006 ISAT

There were 84 students at a party. Square tables and round tables were used for seating. Each square table had 8 seats, and each round table had 10 seats.

How many square tables and round tables could have been used so that all 84 students had a seat and there were no empty seats?

Show all your work. Explain in words how you found your answer. Tell why you took the steps you did to solve the problem.

**Standards 8C, 8D: Writing, Interpreting, and Solving  
Equations Assessment Objective: 8.5.09**  
Solve word problems involving unknown quantities.

# Grade 6 Extended-Response Sample from 2006 ISAT

Use your centimeter ruler to help you solve this problem.

Make a scale drawing of a straight bike path that is 24 miles long. Use the scale 1 centimeter represents 3 miles.

You must include:

- A beginning point.
- An ending point.
- A drinking fountain that is 6 miles from the ending point of the path.

Label all parts of the path.

Show all your work. Explain in words how you found your answer. Tell why you took the steps you did to solve the problem.

**Standards 7A, 7B, 7C: Units, Tools, Estimation, and Applications**  
**Assessment Objective: 7.6.06**  
Solve problems involving scale drawings and maps.

# Grade 7 Extended-Response Sample from 2006 ISAT

The seventh-grade class is planning a pancake breakfast to raise money for their class trip. All materials will be donated except the pancake mix. Based on the given information below, answer the questions that follow.

- Bags of pancake mix cost \$10.00 each.
- Each bag makes 120 pancakes.
- Each person will be served 3 pancakes.

1. How many pancakes would the students need to make to serve 240 people?
2. How much will it cost for all the bags of pancake mix needed to serve these 240 people?

Show all your work. Explain in words how you found your answer. Tell why you took the steps you did to solve the problem.

**Standard 6D: Ratios, Proportions, and Percents**

**Assessment Objective: 6.7.15**

Use proportional reasoning to model and solve problems.

# Grade 8 Extended-Response Sample from 2006 ISAT

The Prairie Land Baseball Conference has 6 teams. The team names are listed below.

Aces  
Broncos  
Cougars  
Wildcats  
Eagles  
Mustangs

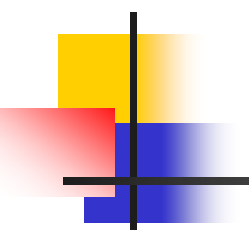
How many games must be played so that every team plays each other once?

Show all your work. Explain in words how you found your answer. Tell why you took the steps you did to solve the problem.

## **Standard 10C: Probability**


### **Assessment Objective: 10.8.07**

Represent all possible outcomes (sample space) for simple or compound events (e.g., tables, grids, tree diagrams).



# Extended-Response in the Classroom: Ideas for helping teachers help students

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- 1) Explain and display the “student-friendly” version of the scoring rubric
- 2) Discuss the “how” and “why” of multiple-choice items, too.
- 3) Discuss and display a variety student work in the classroom.
- 4) Aim for the  !
- 5) Use a T-chart to help guide explanations.
- 6) Use previous ISAT tasks from the sample books. (All are available online.)
- 7) Write about mathematics in a journal/math notebook.
- 8) Practice! Practice! Practice!

# IMPROVEMENT FOR SPRING 2007

The format of the answer document for Session 1 will also be applied to Session 2.

**Mathematics - Session 1 From 2006**

Page 61  
SAMPLES  
A       
B

1       
2

Page 71  
3       
4       
J

Page 71  
6       
7       
8       
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Page 72  
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Page 82  
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Page 83  
38       
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Page 84  
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11  
STOP

WEB SAMPLE-DO NOT USE FOR ACTUAL TESTING

**Mathematics - Session 2 From 2006**

41       
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**DO NOT WRITE  
IN THIS SPACE**

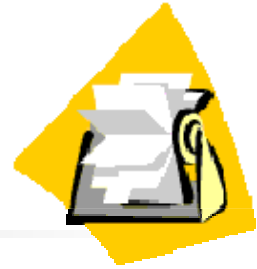
The format for 2007 Session 2  
will mirror Session 1

12  
GO ON

WEB SAMPLE-DO NOT USE FOR ACTUAL TESTING

# Contact Information

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- 217/782-4823
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- [mforness@isbe.net](mailto:mforness@isbe.net)