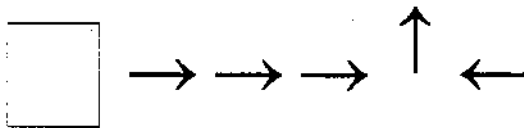
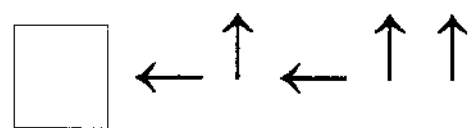
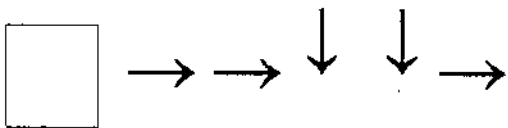
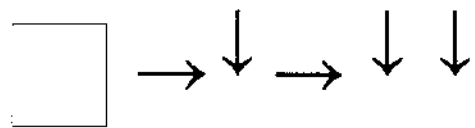
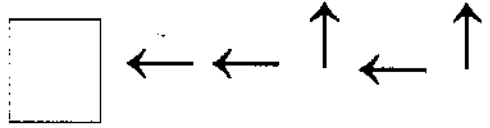
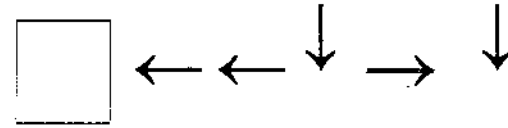
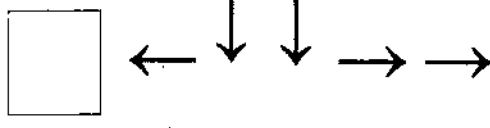
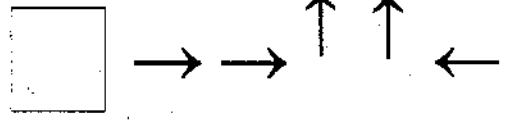


LOGICAL REASONING SKILLS

<p>STARTING</p> <p>30 → → → ↑ ←</p> <p>NUMBER</p>	<p>STARTING</p> <p>74 ← ↑ ← ↑ ↑</p> <p>NUMBER</p>
<p>STARTING</p> <p>44 → → ↓ ↓ →</p> <p>NUMBER</p>	<p>STARTING</p> <p>29 → ↓ → ↓ ↓</p> <p>NUMBER</p>
<p>STARTING</p> <p>63 ← ← ↑ ← ↑</p> <p>NUMBER</p>	<p>STARTING</p> <p>45 ← ← ↓ → ↓</p> <p>NUMBER</p>
<p>STARTING</p> <p>58 ← ↓ ↓ → →</p> <p>NUMBER</p>	<p>STARTING</p> <p>87 → → ↑ ↑ ←</p> <p>NUMBER</p>

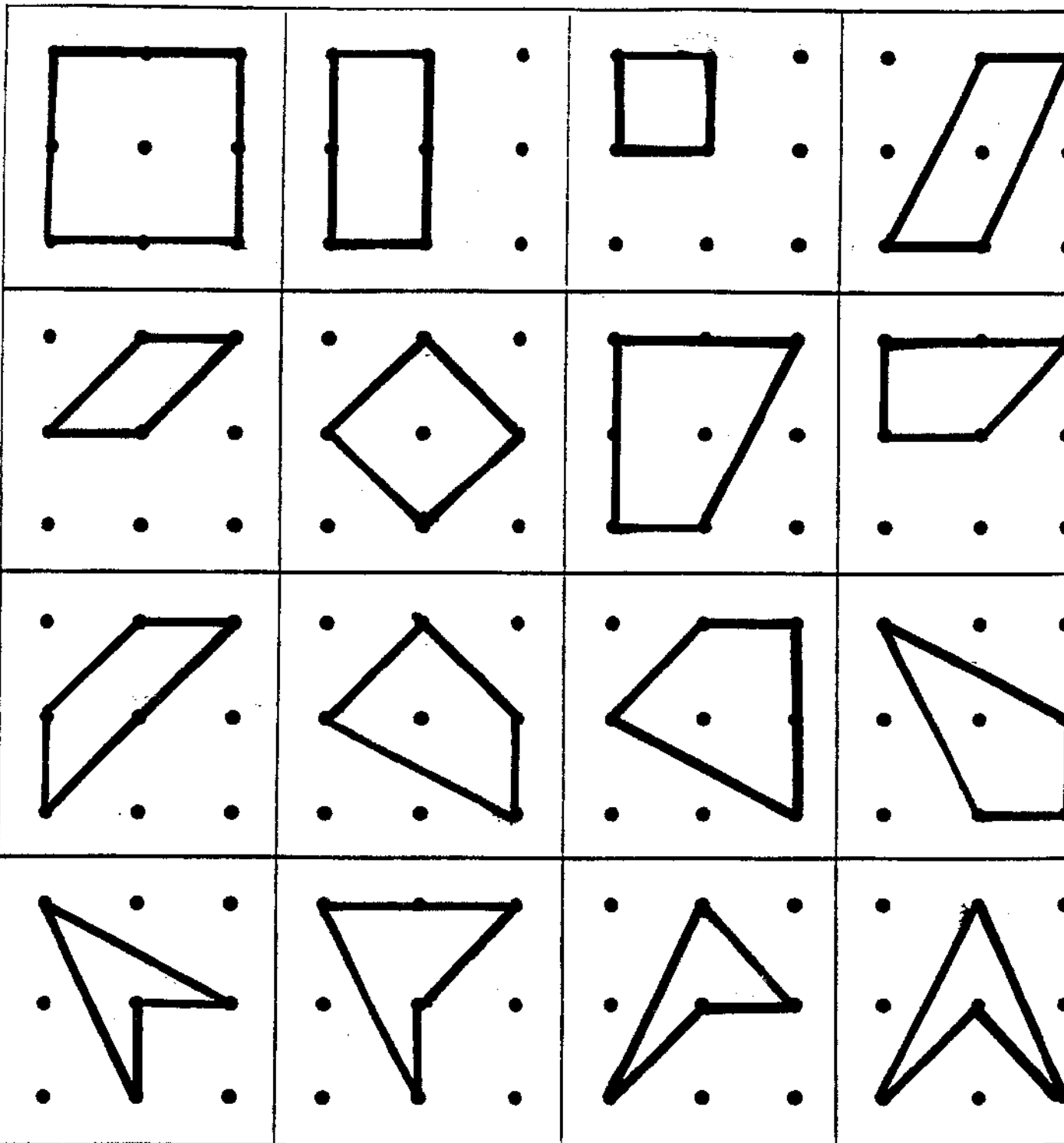
LOGICAL REASONING SKILLS

ASSESS

<p>STARTING</p>  <p>NUMBER</p>	<p>STARTING</p>  <p>NUMBER</p>
<p>STARTING</p>  <p>NUMBER</p>	<p>STARTING</p>  <p>NUMBER</p>
<p>STARTING</p>  <p>NUMBER</p>	<p>STARTING</p>  <p>NUMBER</p>
<p>STARTING</p>  <p>NUMBER</p>	<p>STARTING</p>  <p>NUMBER</p>

GEOCARDS

There are 16 quadrilaterals that can be drawn on a 3 x 3 grid.
Cut the cards apart to form a deck.
Have students sort the quadrilaterals into at least two groups.
Let students describe the attributes of each group or have other
students guess the attributes.



MAGIC CARDS

1	3	5	7	9	11	13	15
17	19	21	23	25	27	29	31
33	35	37	39	41	43	45	47
49	51	53	55	57	59	61	63

2	3	6	7	10	11	14	15
18	19	22	23	26	27	30	31
34	35	38	39	42	43	46	47
50	51	54	55	58	59	62	63

4	5	6	7	12	13	14	15
20	21	22	23	28	29	30	31
36	37	38	39	44	45	46	47
52	53	54	55	60	61	62	63

8	9	10	11	12	13	14	15
24	25	26	27	28	29	30	31
40	41	42	43	44	45	46	47
56	57	58	59	60	61	62	63

16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	31
48	49	50	51	52	53	54	55
56	57	58	59	60	61	62	63

32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47
48	49	50	51	52	53	54	55
56	57	58	59	60	61	62	63

RANDOM DIGIT PAGE

6 0 5 2 4 9 3 8 1 6 3 7 0 5 9 2 4 7 1 8

1 8 1 8 0 6 0 2 5 9 1 4 9 1 8 6 9 0 3 0

5 0 9 4 7 2 9 4 8 0 6 3 5 7 1 4 1 8 7 6

2 7 1 6 5 3 2 0 2 4 8 1 2 6 9 7 3 5 1 4

9 5 3 0 8 7 8 1 5 2 9 4 8 0 4 8 6 9 2 3

4 2 8 4 1 3 4 9 0 6 0 7 2 5 6 1 2 4 8 5

7 1 6 0 9 1 6 7 8 2 8 1 9 3 8 0 9 0 7 1

0 9 4 7 2 5 1 3 0 9 1 5 0 6 1 5 4 3 6 4

3 1 6 3 8 0 9 4 5 2 6 7 3 4 9 7 0 8 1 9

7 6 8 5 2 7 3 6 1 7 3 9 5 0 3 6 5 7 2 0

8 3 0 4 5 8 2 9 5 4 0 7 2 4 8 2 9 1 5 6

0 4 7 9 1 6 4 0 2 8 3 4 9 1 0 4 7 6 3 7

6 2 1 6 8 0 5 3 6 7 1 8 0 7 2 5 3 0 4 8

2 9 4 0 5 4 9 7 8 6 9 2 5 8 4 9 6 5 3 2

4 0 8 3 7 1 6 4 0 3 5 4 7 2 7 1 4 8 0 5

RANDOM DIGITS

6 0 5 2 4 9 3 8 1 6 3 7

1 8 1 8 0 6 0 2 5 9 1 4

5 0 9 4 7 2 9 4 8 0 6 3

2 7 1 6 5 3 2 0 2 4 8 1

9 5 3 0 8 7 8 1 5 2 9 4

4 2 8 4 1 3 4 9 0 6 0 7

7 1 6 0 9 1 6 7 8 2 8 1

0 9 4 7 2 5 1 3 0 9 1 5

ACTIVITIES WITH RANDOM DIGITS



5 2

1. What digit is greater? Less?
2. Read the two-digit number.
3. Find the sum, difference (including negative integers), product, or quotient (including fractions) of the two digits.
4. State whether the two-digit number is even or odd.
5. State whether the two-digit number is prime or composite.
6. Is the two-digit number divisible by 3, 4, 5, or 10?
7. Round the number to the nearest ten.



8 1 5 2 9 4



9
2
8
1

8. Read the multiplace number.
9. What digit is in the hundreds place? Thousands place?
10. Find the sum of the digits.
11. Find the mean, median, mode, or range of the digits.
12. State whether the number is prime or composite.
13. What are the divisors of the number?
14. Round the number to the nearest thousand.
15. Find a set of digits that will give a correct number sentence when operation signs and equal signs are inserted.
16. Find two digits side-by-side that have a sum of 10.
17. Find three digits side-by-side that have a sum of 12.
18. Find two digits side-by-side that have a product of 6.
19. Find a two-digit prime number or a two-digit composite number. Find all the two-digit prime numbers in Row 5.
20. Find the three-digit numbers in Row 1 that are each divisible by 6.
21. Find the two 2-digit prime numbers in Rows 4 and 5, where one number is directly under the other number.

The second type of random digits page may be more appropriate for younger students. It is designed so that pattern blocks will cover various regions. Overhead pattern blocks are ideal for the activities so that the digits will be visible through the pieces; however, wood or plastic blocks will suffice.

22. Use green triangles to cover all the 3s.
23. Use a blue rhombus to cover two digits that have a sum of 9.
24. Use a red trapezoid to cover three digits that have a sum of 10.
25. Use a red trapezoid to cover a three-digit even number in Row 3.
26. Use a yellow hexagon to cover six digits that have a sum of 28.

REACH FOR THE NUMBERS

A MATH INITIATIVE FOR ENGLISH LANGUAGE LEARNERS

Reach for the numbers is a math initiative that annually impacts more than 440 students in grades K - 9 at five schools within the South Bend, Indiana Community School Corporation (SBCSC). Through this initiative, teachers deepen their content knowledge of mathematics and their pedagogical knowledge of teaching mathematics using scientifically research - based instructional strategies, thus providing opportunities for English Language Learner (ELL) students to achieve academic English - proficiency within the context of mathematics. Partners for the project are SBCSC's Department of Bilingual Education, Extended Learning and Curriculum and Saint Mary's College's Mathematics and Education Departments.

By integrating mathematics and language instruction, strategic and innovative class activities can provide experiences that bridge gaps in ELL students' math knowledge, expand their communicative competence in English, and ultimately prepare them for success in future math coursework, enabling them to master the Indiana Academic Mathematics Standards.

The outcomes of this project are four-fold:

1. Teachers will implement scientifically research-based instructional strategies that will increase student academic achievement among ELL students in mathematics and English language proficiency within the context of mathematics.
2. ELL students' math scores will improve on the ISTEP+ tests.
3. Teachers of English Language Learners will become "highly- qualified" as defined by the Indiana Professional Standards Board.
4. ELL teachers' intellectual growth will be stimulated and their math knowledge and skills will be updated.

Teaching ELL students "mathematics language"---unique terms, symbols, and expressions that occur in math discourse---enables them to communicate on the subject and to clarify their math thinking as it develops language skills. ELL students will improve their critical thinking skills and become more confident and independent learners as their academic English increases.

Points of Interest

- South Bend Community School Corporation is the fourth largest school district in Indiana, with almost 22,000 students.
- It has the largest number of ELL students in the state.
- Almost 62% of the students qualify for free and/or reduced lunch.
- SBCSC students are performing well below the state averages on the ISTEP+.
- Of the 17 teachers representing five schools in the initial program, 3 had a bachelor's degree, 9 had a master's degree, 1 had a master of fine arts degree, and 1 had a bachelor's degree in mathematics and was completing a "transition to teaching" program.
- Barriers to math achievement by K - 9 ELL students identified by the project participants were prior instruction, proficiency in basic skills, and parental support.
- Teachers' ranking of students needs are:
 - Algebra
 - Probability
 - Computation
 - Problem Solving (tie)
 - Statistics (tie)
 - Functions
 - Geometry
- Professional development includes inquiry-based learning, hands-on problem solving activities, cooperative learning, peer tutoring, Active Mathematics Teaching (ATM), and Cognitively Guided Instruction (CGI).
- A pre-test based on previous ISTEP+ questions was administered to participants (Grades K - 3, Grade 3 ISTEP; Grades 4 - 6, Grade 6 ISTEP; Grades 7 - 12, Grade 10 ISTEP),
- Teachers received a stipend of \$100/day during the summer, and \$20/hour during the monthly meetings during the school year.
- Developmentally appropriate math supplies were purchased to support ELL teachers.
- Indiana Mathematics Standards by grade levels were distributed to each participant.

Program Goals

- ELL teachers from the five targeted schools will complete years 1 and 2 of the program.
- ELL teachers will deepen their mathematical content knowledge and update their instructional strategies.
 - Provide opportunities for enhanced and on-going professional development that improves subject matter knowledge of these teachers.
 - Strengthen teachers' conceptual understanding, problem solving skills, and confidence in doing mathematics through instructional activities and approaches that can be adapted to the classroom.
 - Promote strong teaching skills of K-9 ELL teachers in math, increasing their repertoire of effective, scientifically-based teaching methods and technology-based teaching methods into the curriculum
 - Provide professional development and on-site support, based on initial needs assessment and on-going feedback, that is aligned to the recommendations by NCTM in its *Principles and Standards for School Mathematics* (2000).
 - Model and develop "best practice" strategies for teaching K-9 mathematics and support teachers in the use of these strategies in their classrooms.
 - Encourage the use of manipulatives and technology in math instruction and assessment.
 - Provide activities for students to use higher-level thinking skills and problem solving in authentic contexts.
 - Connect math to students' past, making the language and learning relevant.
- ELL students not passing the math section of the ISTEP+ will decrease the difference between the passing score and their actual performance by at least 25 points in SY 2004 and by the same number in school year 2005.
 - Implement research-based math instructional strategies, designed for ELL, that raise math performance.
- ELL teachers (70%) will become "highly qualified" as defined by IDOE criteria.
 - Build and support a community of practitioners who experiment, reflect upon, and share with their colleagues performance-based strategies for teaching mathematics.
 - Promote and support on-going professional development between partners in order to narrow the gap between theory and practice.
- ELL Grade 6 students (60%) will pass the math section of the ISTEP+ in 2006 and 2007; 50% of Grade 8 students and 35% of grade 10 ELL students will the math section during the same years.
 - Emphasize strategies for aligning instruction and performance-based assessments that increase students' math achievement.
 - Implement research-based math instructional strategies, designed for ELL that raised math performance.

**EQUATIONS
SCORING SCHEME**

POINTS

TYPE OF EQUATION

1

$$3 + 5 = 8 \quad 6 = 7 - 1 \quad 8 = 2 \times 4 \quad 6 \div 3 = 2$$

$$5 \times 8 \times 2 \times 1 \times 0 \times 9 \times 3 = 4 \times 2 \times 3 \times 8 \times 0 \times 3$$

2

$$7 + 2 = 3 + 6 \quad 36 \div 4 = 9 \quad 9 - 6 + 2 = 5$$

3

$$5 + 1 + 2 - 4 = 3 + 1 \quad 64 + 21 = 85$$

4

$$2 + 8 - 3 + 7 + 5 - 6 = 8 + 5$$

$$\sqrt{81} = 9$$