Mathematics Coaching Program

1945 N. High St., Arps Hall, Room 285
Columbus, OH 43210
Phone (614) 688- 5997
Fax (614) 292-7695

Patti Brosnan, Ph.D., Executive Director
Azita Manouchehri, Ph.D., Associate Director
Tim McKeny, Ph.D., Associate Director

Dear Sir/Madam:

As you may know, Mathematics Coaching Program (MCP) provides professional development for K-12 mathematics coaches across the state of Ohio. Educators are often placed in coaching positions with little guidance. This program is an expansive professional development program that provides the level of support to the coaching position in a more effective manner. Please note that MCP is not a pull-out program. Coaches provide job-embedded professional development by teaming with teachers in the classroom while working with the teachers' students. We are currently processing applications for recruiting mathematics coaches for 2014-2015 academic years. The application package includes the following:

1. Information on MCP and its impact
2. Information on MCP's professional development program
3. The Ohio School Board Association Newsletter (report on MCP achievements is the second page of the article)
4. Assurances
5. The principals program
6. Application form
7. Criteria for selection of a mathematics coach
8. MCP Inventory

To learn more about MCP, please view our website at, http://mcp-coaching.osu.edu .

If you would like to be considered for the Mathematics Coaching Program (MCP), please complete the application form and return it to: mcp_coaching@osu.edu

Applications received by <u>June 30th</u> will obtain priority consideration.

Regards,

Patti Brosnan

Dr. Patti Brosnan, Executive Director

Azita Manouhehri   Tim McKeny

Drs. Azita Manouhehri and Tim McKeny, Associate Directors

Mathematics Coaching Program
The Ohio State University
Department of Teaching and Learning
1945 N. High St., Arps Hall, Room 285
Columbus, OH 43210

MCP Application

Dr. Patti Brosnan
Executive Director

Dr. Azita Manouchehri
Dr. Tim McKeny
Associate Directors

Raising Students' Mathematics Scores with the Mathematics Coaching Program (MCP)

What is the MCP?

Ohio has huge achievement gaps in children's mathematics achievement by race and socioeconomic status. The Mathematics Coaching Program (MCP) at The Ohio State University has entered low achieving schools in Ohio to provide children access to the opportunity to succeed in mathematics and resolve academic emergency status. Approximately 98,000 children at 175 Ohio elementary and middle schools improved their math skills last year, thanks to the Mathematics Coaching Program (MCP) directed by Ohio State University Associate Professors Patti Brosnan and Diana Erchick.

MCP has achieved remarkable success in a short time. Preliminary results show, for example, in the first year, rural students from an economically disadvantaged group scored at an 85% passage rate on the mathematics portion of the Ohio Achievement Test.; also in the first year, our first Appalachian school had gains of over 100% in grade three; during the first two years, the average gain of the 11 participating urban schools across grades three through five was 13 percentage points, with seven of the 11 schools leaving Academic Emergency to achieve Adequate Yearly Progress (AYP). Even more stunning, in one school, students in coached classrooms scored 85% on the math portion of the Ohio Achievement Test, while students in the same school not in a coached classroom remained at a 44% achievement rate.

Given the program's success, the sponsor, the Ohio Department of Education (ODE), asked the Ohio State team to scale up for the sixth year. To achieve this growth, Brosnan and Erchick invited expert math faculty at five additional Ohio universities to join the program. The faculty members train the coach facilitators following a research-based protocol developed by Brosnan and Erchick. Also actively collaborating are three Ohio educational service centers and staff from ODE. As a team, they now engage well over a hundred seventy-five schools and 98,000+ children at elementary, middle, and high schools.

Currently, MCP has partnerships and collaborative programs with the Ohio Department of Education, The Ohio State University and OSU-Newark, University of Dayton, John Carroll University, Miami University, Ohio University, Youngstown State University; with educational service centers including: Lake County Educational Service Center, North Central Ohio Educational Service Center; and Tri-County Educational Service Center, and 29 school districts. Thus, the MCP project is in every corner of the state thereby not only forming and maintaining partnerships, but are outreaching to communities, to their students and quite simply and ultimately, to Ohio's future. The Mathematics Coaching Program has been partially funded through the Ohio Department of Education for the past four years. The first year was a pilot year to test the MCP's professional development and coaching model. It demonstrated promising results. The first five years showed such strong results that ODE asked that the program to expand from the initial 34 schools to 175.

MCP provides access to mathematics for students who have underachieved. The MCP leadership believes in investigating how children can learn, with collaborations designed to study children who struggle. As the preliminary research indicates, students have morphed from struggling with mathematics to embracing and ultimately becoming mathematically successful.

How the MCP Works

To prepare coaches to deliver professional development to teachers, coach facilitators provide them with two days per month of whole-group intensive training and another two days of small group work. The coach facilitators also provide coaches with consistent, ongoing technical support as needed. Mathematics coaches work full-time in the schools, often with Title I funding. They partner with classroom teachers to ensure that they and the children gain a more rigorous knowledge of content and process in mathematics. The coaches provide one-on-one intensive professional development to teachers on-site, teaching them—
• mathematics content
• pedagogy
• student learning theory
• how to work with student data
• how to make data-based decisions

Teachers describe the barriers they face when using research-based practices in the challenging climate of their specific classrooms. Coaches are prepared thoroughly in these practices so they can enter classrooms, collaborate with teachers, and determine how to get research-based ideas to work in each unique situation.

The MCP Coach Approach

The MCP coaching approach includes content-focused, intensive one-on-one, data-based professional development. The professional development sessions focus on increasing the coaches' knowledge of student thinking and ways in which this knowledge could influence curriculum and instructional design to enhance learning. During the whole group monthly professional development sessions, the coaches engage in solving mathematical problems in multiple ways and compare their own methods for solving problems with those used by children. They reflect on instructional strategies used for facilitating their own learning that could be transferred to their schools. They also examine, collaboratively, problems related to practice and ways in which inquiry based instruction may be enacted in classrooms. The coaches also learn about the teaching strategies effective for instructing key mathematics concepts and examine the usefulness of certain teaching approaches based on the data they collect from their own settings. Each of the coaches then uses the knowledge gained from the professional development sessions in their work with teachers in their respective schools.

Coaches are asked routinely to provide the project staff with their specific needs according to what is difficult to teach drawing from either their own experiences or their observations of classrooms. Coaches' feedback guides the choice of resources and activities that the project staff uses during the subsequent professional development sessions throughout the year.

Share this *Success*

A single copy of *Success* is sent to student achievement liaisons with the hope that you will duplicate and share it with fellow board members and administrators monthly at a board meeting. Some liaisons distribute copies of *Success* throughout their districts to building principals and central office staff. Back issues can be found on OSBA's student achievement Web page,   **www.osba-ohio.org/sa.htm**.

SALT resource kit in mailing

With this *Success* issue, you will find a resource kit examining grants and grant-writing. OSBA's resident expert on grants, **Cheryl Ryan**, education management consultant, offers a look at successful grant-writing. The Web-based program supplements the printed materials in this mailing.

Discipline and achievement

You don't need a study to prove that good students are rarely disciplined, and frequent visitors to the principal's office do not do as well as they could in the classroom. Ask your administrators to discuss their effective discipline policies and how they help improve student achievement.

Paying students pays

Paying students up to $32 a week is improving academic performance in two Fulton (Ga.) County schools. Forty struggling middle and high school students were selected for a privately funded after-school tutoring program, which rewarded them financially based upon attendance and participation. **Charles Loudermilk**, chairman and chief executive officer of Aaron Rents, donated $60,000 for the program. To read the *Atlanta Journal-Constitution* story, go to **www.ajc.com/metro/content/metro/ stories/2008/05/16/study_0514.html.**

Sell your summer school

The June board meeting is a good time to promote your district's summer school. Invite the director of your summer instructional program to make a presentation to the board and community. Taxpayers like to see their schools being used efficiently year-round. If your program is tuition-based, share the financial details.

Student achievement research brief

*Each month, **Success** brings you a research brief to share with fellow board members.*

Mathematics Coaching Program improves student performance on Ohio Achievement Test

Ohio, like the nation, has huge achievement gaps in children's mathematics scores by race and socioeconomic status. The Mathematics Coaching Program (MCP), the brainchild of professors **Patti Brosnan** and **Diana Erchick** from the Ohio State University School of Teaching and Learning, has enrolled 70 of the lowest achieving K-6 schools in Ohio, hoping to understand how children learn mathematics and resolve a district's academic emergency.

For this school year, MCP widened its scope from 30 schools to 70 urban, urban-fringe and rural schools throughout Ohio. On average, 15 teachers per building participate, so about 1,050 teachers, 15 facilitators, 70 coaches and 26,750 students (averaging 25 per class) will participate in the Mathematics Coaching Program.

MCP has already achieved remarkable success in a short time. As an example, preliminary results show that in the first year, one Appalachian school had 32% of its students at or above proficient before MCP, but 67% at or above proficient as a result of the program.

During the first two years, the average gain of 11 participating major urban schools across grades three through five was 13 percentage points, with seven of the 11 schools leaving academic emergency and achieving adequate yearly progress.

Even more stunning, in one school, students in coached classrooms scored 85% at or above proficient on the math portion of the Ohio Achievement Test, while students in the same school, but in a non-coached classroom, remained at a 44% achievement rate.

Due to the success of the Mathematics Coaching Program, the Ohio Department of Education has funded MCP for the past three years at $350,000, $675,000 and $1.1 million, respectively. The first year was a pilot year, where the Mathematics Coaching Program's professional development and coaching model were tested. With the first year demonstrating promising results, and the second year showing even stronger results, funding continues. As more school districts participate, MCP is poised to become a model to not only improve students' perceptions, but indicates a strong correlation for increased Ohio Achievement Test scores.

For more information, contact mcp_coaching@osu.edu or (614) 688-5997.
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Mathematics Coaching Program
Assurances 2013-14   (DRAFT)

The following assurances are program specific and are in addition to any assurances from grants and/or programs. By agreeing to participate in the professional development aspect of the Mathematics Coaching Project (MCP), the district agrees to the conditions outlined below.

The following assurances are organized according to job responsibility:

1. The Field Faculty (Program Directors and Co-Directors) is expected to:
- Provide high quality professional development for facilitators and coaches.
- Obtain University approval of all associated research practices.
- Provide intervention strategies for teachers of students who struggle learning mathematics.
- Provide assessment strategies to assist teachers with instruction.
- Provide detailed data collection procedures.
- Provide detailed data analysis reports.
- Honor confidentiality of student and teacher data and documents.
- Collaborate with advisory board and mathematicians on program implementation.
- Recruit facilitators, satellite directors, mathematicians, and researchers.
- Assist districts as needed with selection of coaches.
- Train facilitators, coordinate activities and conduct regular facilitator meetings.
- Work with principals to ensure understanding of the MCP.
- Oversee the evaluation of entire project.
- Manage program, personnel, evaluation procedures, and communication to ensure oversight of all program components.

2. The Program Facilitator is expected to:
- Conduct regular meetings (twice per month) with coaches to monitor progress and mediate concerns.
- Provide implementation direction to coaches.
- Conduct school visits to assist with program implementation.
- Complete two site-visit inventories per coach per year.
- Participate fully in all large group professional development sessions.
- Attend ALL program facilitator meetings.
- Invest 32 hours per month on the Mathematics Coaching Program.
- Submit weekly facilitator reports.
- Manage data collection procedures from their coaches.
- Provide support, oversight, and assessment of documentation for program requirements.
- Be responsible for all assigned coaches' work and completion of assignments.
- Communicate and serve as liaison with administration as appropriate.
- Communicate and serve as liaison with school staff as appropriate.

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3. The Mathematics Coach is expected to:
- Provide full-time, on-site, job-embedded professional development for classroom teachers in mathematics.
- Provide awareness sessions at each school so that all staff members are informed of the project.
- Assist with student tests, such as OATs, primary grades diagnostics, and problem sets.
- Conduct diagnostic interviews with selected students.
- Collect student assessment data including achievement tests, classroom assessments, and student work samples.
- Assist in establishment of building goals, strategies, and action steps, based on data
- analysis and work with staff.
- Document work performed, maintain schedules, collect data, and complete all other program requirements.
- Implement MCP instruction and assessment strategies as presented in the PD sessions.
- Team-teach with 3 or 4 teachers everyday for about 6 weeks, and then select the next 3 or 4 teachers.
- Provide professional development for teachers through pre- and post-lesson conference
- sessions, team teaching, analysis of student work and assessment data, and discussion of researched-based practices.
- Provide assistance for teachers in learning mathematics content, pedagogy, and
- assessment strategies to improve student learning and achievement.
- Attend all professional development sessions in their entirety for two days each month.
- Meet twice each month with the facilitator.
- Honor confidentiality of teacher and student data, documents, and communication.

The following assurances are organized according to job responsibility.

1. The *Building Administrator* is expected to:
- Attend and participate in sessions designed for administrators, to become familiar with the project's key components.
- Provide space, desk, supplies, and access to a computer and Internet connection for the mathematics coach.
- Designate time on faculty meeting agendas for coaches to share progress.
- Permit the Field Faculty to conduct program evaluative research that includes mathematics achievement tests, classroom assessments, and sample student work and mathematics teacher inventories.
- Arrange participating teachers' scheduled "mathematics time" to be consecutive and
- not concurrent times.
- Support scheduling of pre-and post-lesson conferences for teachers and coaches.
- Provide time for coach to collaborate with teachers scoring pretests and professional development purposes.
- Support the coach working with 3 (minimum) or 4 (maximum) teachers for about 6 weeks at a time to work in classrooms, as this is not a pull-out program.
- Assign MCP mathematics coaches no more teacher duties than assigned to any other
- classroom teacher.
- Help protect the coaches' time by not allowing them to work as substitutes, taking on other projects, and limiting their participation in additional PD programs.
- Avoid assigning coaches additional tasks or committee work outside of MCP assigned responsibilities.
- Honor confidentiality of the teacher/coach relationship.

2. The *Building Mathematics Teachers* are expected to:

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- Support coaches in their work with team teaching, studying student thinking, facilitating student sharing, reflecting on the process, and collecting data.
- Schedule mathematics time when coach is available during the 4 to 6 weeks with the coach.
- Implement specified instructional strategies and assessments and participate in pre- and post-lesson conferences with the coach to plan and analyze instructional decisions at least once per week.
- Participate in project evaluative research by completing questionnaires, mathematics inventories, and allowing staff to observe and conduct interviews.
- Select student work to analyze at pre- and post-lesson conferences with the coach.
- Remain in classroom with your coach to collaborate in planning, assessment, teaching, and classroom management each and every day.

3. The *District* is expected to:
- Support coaches in their work with team teaching, studying student thinking, facilitating student sharing, reflecting on the process, and collecting data.
- Schedule mathematics time when coach is available during the 4 to 6 weeks with the coach.
- Implement specified instructional strategies and assessments and participate in pre- and post-lesson conferences with the coach to plan and analyze instructional decisions at least once per week.
- Participate in project evaluative research by completing questionnaires, mathematics inventories, and allowing staff to observe and conduct interviews.
- Selected student work to analyze at pre- and post-lesson conferences with the coach.
- Remain in classroom with your coach to collaborate in planning, assessment, teaching, and classroom management each and every day.

If you agree to the stated Assurances, please sign and print your name, and return this form to:

Ann Carlson, Mathematics Consultant
Ohio Department of Education
25 South Front Street, MS 509
Columbus, OH 43215-4183

Retain a copy for your records.

_____   _____
District Superintendent   Date

_____   _____
Building Principal   Date

_____   _____
Union Representative   (Optional)   Date

_____   _____
Mathematics Coaching Project Director   Date

ASSURANCES ARE DUE TO ODE BY: October 1, 2014

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The MCP Principals Program

The MCP provides Principals Program for administrative support and professional development. The principals are expected to participate in the activities designed specifically for the purpose of enhancing communication between the school personnel and project staff and for supporting the delivery of the MCP. The program is intended to assist the principals in fully understanding the goals of the project, MCP's professional development approach and ways in which coaches may be supported at the school level. The principals are eligible to sign up for two hours of graduate credit for their participation.

The program consists of the following components:

- Principals will each attend two ½ day sessions (one in autumn and another in the late winter, with a choice of one of three regional locations and days at each of the autumn and winter sessions).
- Principals will attend 2 full days at MCP's monthly professional development sessions (their choice of dates out of the scheduled MCP PD sessions) to learn about the program.
- Principals will meet for 2 hours with Project Directors for debriefing and discussion at each of the 2 days they attend MCP professional development days.

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MCP School Application Form

If you would like your school to be considered for the Mathematics Coaching Program (MCP), please complete this form and return it to mcp_coaching@osu.edu .

Please retain a copy for your records.

Contact Name: _____

Job Title: _____

Interested School: _____

District: _____

County: _____

Principal's Name: _____

Principal's Phone Number: _____

School Phone Number: _____

E-mail Address(es): _____

_____

Would you like MCP staff support in choosing a coach, interviewing, and/or scoring the MCP Content and Pedagogy Inventory? Please elaborate on your needs for support.

_____

_____

After processing your application we will send you further details
about the program and how to get started.

***Thank you for your interest! If your school is selected, you will also help us learn more ways
to help children achieve higher levels in mathematics. Thank you!***

Ohio | Department of Education

THE OHIO STATE UNIVERSITY

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Mathematics Coach Selection Guidelines

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Procedure

1. Recruitment (You may have the perfect person in mind already.)
2. Application (You may want to widen your selection pool.)
3. Documents to solicit from applicants
   a. Resume`, Transcripts
   b. Letter of intent, Reference letter(s)
   c. Completed MCP Content and Pedagogy Inventory (Provided and scored by MCP project staff.)
   d. Completed application
4. Interview (suggested questions provided by MCP)
5. Performance Assessment (i.e. video of teaching)

Suggested Qualifications

1. P-6 Mathematics Specialist Endorsement (or some coursework completed toward P6MSE)
2. Degree in mathematics or mathematics education; masters in education
3. Mathematics content knowledge coursework
4. Pedagogical content knowledge in line with current state and national expectations
5. Experience teaching; note grade level, subjects taught
6. A minimum three consecutive years of successful mathematics classroom experience
7. Successful teaching of students who struggle
8. Experience as a teacher leader
9. Experience as a professional development provider
10. Recent professional development as a participant
11. Experience in research data collection and analysis and data based decision making
12. Demonstrated commitment in math professional development
13. Good communication skills
14. Good organizational skills
15. Good personal and professional relation skills
16. Flexibility in collaborative work
17. Willingness to delve into mathematics content
18. Commitment to a five-day summer workshop
19. Commitment to before and after school time to meet with teachers
20. Demonstrate a genuine interest in how students think and a commitment to student understanding

Selection Committee, please try to include one or more of these persons:

1. MCP Principal Investigators or representative(s)
2. ODE Representative(s)
3. SST (School Support Team) Director(s)
4. Teaching Learning Collaborative Director

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Criteria for Selection of a Mathematics Coach

Criteria (5 high)	5	4	3	2	1
P-6 Mathematics Specialist Endorsement					
Degree in mathematics, mathematics education; masters in education					
Mathematics content knowledge coursework					
Pedagogical content knowledge					
Years of teaching, grade level, subjects					
A minimum three consecutive years of successful classroom experience					
Successful teaching of students who struggle					
Experience as a teacher leader					
Experience as a professional development provider					
Recent professional development as a participant					
Experience in research data collection and analysis and data based decision making					
Demonstrated commitment in math professional development					
Good communication skills					
Good organizational skills					
Good personal and professional relation skills					
Flexibility in collaborative work					
Willingness to delve into mathematics content					
Commitment to before and after school time to meet with teachers					
Demonstrate a genuine interest in how students think and a commitment to student understanding					

Name	Total	Subtotals				

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For interview or written responses:

1. What is your philosophy of teaching and learning mathematics?

2. Why do you want to be a mathematics coach?

3. What kinds of expertise do you bring to this position?

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1. Students sometimes remember only part of a rule. They might say, for instance, "two negatives make a positive." For each operation listed, decide whether the statement "two negatives make a positive" sometimes works, always works, or never works. (Mark SOMETIMES, ALWAYS, NEVER, or I'M NOT SURE.)

	Sometimes works	Always works	Never works	I'm not sure
a) Addition	1	2	3	4
b) Subtraction	1	2	3	4
c) Multiplication	1	2	3	4
d) Division	1	2	3	4

2. Ms. Whitley was surprised when her students wrote many different expressions to represent the area of the figure below. She wanted to make sure that she did not mark as incorrect any that were actually right. For each of the following expressions, decide whether the expression <u>correctly represents</u> or <u>does not correctly represent</u> the area of the figure. (Mark REPRESENTS, DOES NOT REPRESENT, or I'M NOT SURE for each.)

a

a 5
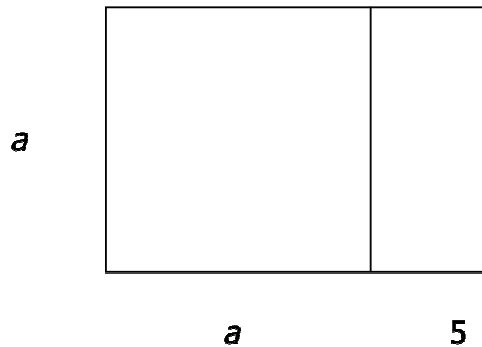
	Correctly represents	Does not correctly represent	I'm not sure
a) $a^2 + 5$	1	2	3
b) $(a + 5)^2$	1	2	3
c) $a^2 + 5a$	1	2	3
d) $(a + 5)a$	1	2	3
e) $4a + 10$	1	2	3

3. You are working individually with Bonny, and you ask her to count out 23 checkers, which she does successfully. You then ask her to show you how many checkers are represented by the 3 in 23, and she counts out 3 checkers. Then you ask her to show you how many checkers are represented by the 2 in 23, and she counts out 2 checkers. What problem is Bonny having here? (Mark ONE answer.)

   a) Bonny doesn't know how large 23 is.

   b) Bonny thinks that 2 and 20 are the same.

   c) Bonny doesn't understand the meaning of the places in the numeral 23.

   d) All of the above.

4. Ms. Walker's class was working on finding patterns on the 100's chart. A student, LaShantee, noticed an interesting pattern. She said that if you draw a plus sign like the one shown below, the sum of the numbers in the vertical line of the plus sign equals the sum of the numbers in the horizontal line of the plus sign (i.e., 22 + 32 + 42 = 31 + 32 + 33). Which of the following student explanations shows sufficient understanding of <u>why this is true</u> for all similar plus signs? (Mark YES, NO, or I'M NOT SURE for each one.)

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	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	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Yes   No   I'm not sure

a) The average of the three vertical numbers equals the average of the three horizontal numbers.
   1   2   3

b) Both pieces of the plus sign add up to 96.
   1   2   3

c) No matter where the plus sign is, both pieces of the plus sign add up to three times the middle number.
   1   2   3

d) The vertical numbers are 10 less and 10 more than the middle number.
   1   2   3

5. After a recent student-centered lesson that focused on classifying shapes based on their properties, a third-grade teacher overheard the following verbal exchange between students in her class:

Spike: **After we've been looking at these shapes all week, I think that squares are a whole lot like rectangles.**
Guido: **I don't think you know what you're talking about! Everybody knows that rectangles are special types of squares.**

a)   Explain each student's thinking.

b)   What concepts are they addressing in their conversation?

c)   How would you help them develop definitions for squares and rectangles?

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6. Mrs. Parker liked to vary the whole amount when teaching fractions, so she used as the whole this picture of two pumpkin pies.
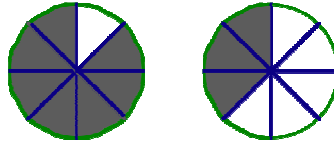
Last Thanksgiving, she baked two pumpkin pies, but only the shaded parts of the pies were eaten. She asked her class what fraction of the whole amount of pie she baked was eaten.

For each student response that follows, indicate if the student was correct or incorrect, and indicate what fraction concept the student's answer indicated she or he does or doesn't understand.

a. Frank said it was $\dfrac{10}{8}$

   Is his answer correct or incorrect? (circle one)

   Indicate what fraction concept the student's answer indicated she or he does or doesn't understand.

b. Sheryl said it was $\dfrac{10}{6}$

   Is her answer correct or incorrect? (circle one)

   Indicate what fraction concept the student's answer indicated she or he does or doesn't understand.

c. Katelyn said it was $\dfrac{5}{8}$

   Is her answer correct or incorrect? (circle one)

   Indicate what fraction concept the student's answer indicated she or he does or doesn't understand.