Part A

1	**Name of school.**	
	a. **Type of school. (Rural or Urban) and (Public or Private)**	**Rural** / **Urban** / **Private** / **Public**
2	**What is your gender? (Circle One)**	**Male** / **Female**
3	**Circle your age group.**	**20 - 29** / **30 - 39** / **40 - 49** / **50 - 59**
4	**What is your highest level of education?**	**Diploma** / **Bachelor's** / **Graduate Diploma** / **Master's**
5	**What was your major of study in post-secondary?**	
6	**Check the areas of teacher college courses you completed:**	**Check all that apply**
	a. Methods of teaching mathematics.	
	b. Mathematics content courses for primary school mathematics.	
	c. Mathematics content courses for junior high school mathematics.	
	d. Mathematics content courses for senior secondary school mathematics.	
7	**How many years have you been teaching (including this year)?**	
8	**What primary level grades have you taught? (Check all that apply)**	**Primary 1** / **Primary 2** / **Primary 3** / **Primary 4** / **Primary 5** / **Primary 6**
9	**Circle all primary grade level(s) you are teaching this year.**	**Primary 4** / **Primary 5** / **Primary 6**
10	**When teaching mathematics which local languages do you use? (Circle all that apply)**	**Ashanti** / **Akuapem** / **Ewe** / **Fante** / **Ga-Adangbe** / **Guan** / **Mole-Dagbon** / **Other**

11	**Which Ghanaian language(s) is/are taught in your school? (Circle all that apply).**	**Adangbe**	**Akuapem Twi**	**Asante Twi**	**Bono**
		Dagbani	**Ewe**	**Fanti (Mfantse)**	**Ga**
		Gonja	**Hausa**	**Kokomba**	
12	**Which Ghanaian languages do *most* pupils in your class(es) speak? (Circle all that apply).**	**Adangbe**	**Akuapem Twi**	**Asante Twi**	**Bono**
		Dagbani	**Ewe**	**Fanti (Mfantse)**	**Ga**
		Gonja	**Hausa**	**Kokomba**	
13	**Which Ghanaian language do you consider to be your mother tongue?**	**Adangbe**	**Akuapem Twi**	**Asante Twi**	**Bono**
		Dagbani	**Ewe**	**Fanti (Mfantse)**	**Ga**
		Gonja	**Hausa**	**Kokomba**	

14	**How would you rate your language proficiency in your mother tongue in reading, speaking, listening and writing? (Circle one under each category)**	**Reading**	**Speaking**	**Listening**	**Writing**
		Needs Work	Needs Work	Needs Work	Needs Work
		Good	Good	Good	Good
		Very Good	Very Good	Very Good	Very Good
		Excellent	Excellent	Excellent	Excellent

15	**In general, how would you rate your English language proficiency in reading, speaking, listening and writing?**	**Reading**	**Speaking**	**Listening**	**Writing**
		Needs Work	Needs Work	Needs Work	Needs Work
		Good	Good	Good	Good
		Very Good	Very Good	Very Good	Very Good
		Excellent	Excellent	Excellent	Excellent

16 **How comfortable are you:**

	Not comfortable	Somewhat comfortable	Comfortable	Very comfortable
	0%	1 - 25%	26 - 75%	76 - 100%
a. Teaching mathematics at the primary grade level(s) you teach				
b. Teaching mathematics with other subjects				
c. Providing mathematics instruction that meets national mathematics content standards				
d. Using a variety of assessment strategies				
e. Teaching problem-solving strategies				
f. Teaching mathematics with manipulatives such as counting blocks (bottle caps) or geometric shapes				
g. Teaching a class of pupils with differering mathematical ability				
h. Teaching mathematics in English				
i. Teaching mathematics to pupils of differing levels of English proficiency				

17 **What are the biggest challenges of teaching mathematics in your school?**

	Check up to two (2) items
a. Pupil motivation	
b. Teacher resources	
c. Level of your mathematical knowledge	
d. Classroom resources	
f. Low English proficiency of pupils	

18 **Do you feel the need to adjust your teaching instruction for different groups within the same classroom?**

YES	NO

19 **If you were asked to observe a teacher's mathematics class for one or more lessons, what would you look for to determine high quality instruction? (What is good mathematics teaching?)**

Part B

20 How do you introduce a new topic to pupils?

21	**Do you provide real life application for a new topic? (Circle one)**	**Never**	**At least 25% of the time**	**At least 50% of the time**	**At least 75% of the time**	**Always**
22	**Do you show more than one method for solving similar problems? (Circle one)**	**Never**	**At least 25% of the time**	**At least 50% of the time**	**At least 75% of the time**	**Always**
23	**I speak pupils home languages in class while teaching to help them understand mathematics concepts. (Circle one)**	**Never**	**At least 25% of the time**	**At least 50% of the time**	**At least 75% of the time**	**Always**

24	**Pupil Participation / Engagement: (In English)**	**Circle Yes or No**	
a.	I plan time for pupils to work together in pairs or groups during class.	YES	NO
b.	I ask pupils to explain how they solved mathematical problems with the class.	YES	NO
c.	I encourage pupils to share multiple ways of solving the same problem.	YES	NO
d.	I give pupils unfamiliar problems to work on which use prior lessons and topics.	YES	NO
e.	I encourage pupils to draw/use pictures, graphs, tables or charts to solve word problems.	YES	NO

25	**Pupil Participation / Engagement: (In Mother Tongue)**	**Circle Yes or No**	
a.	I encourage pupils to speak their mother tongue or local language to demonstrate their understanding.	YES	NO
b.	I encourage pupils to speak their mother tongue or local language when in pairs to share their understanding of mathematical problems.	YES	NO
c.	I take time to teach mathematical vocabulary to help pupils understand the concepts	YES	NO
d.	I teach English grammar to help pupils understand mathematics concepts	YES	NO
e.	I use pictures, graphs, tables or charts to help pupils understand word problems	YES	NO

Part C

26	It is important for pupils to do the following:	Strongly disagree	Disagree	Agree	Strongly agree
i.	Watch the teacher demonstrate how to solve a problem				
ii.	Copy notes from the board				
iii.	Complete computational problems from the textbook or worksheet				
iv.	Present or demonstrate solutions to a mathematics problem to the class				
v.	Use concrete resources (ex. bottle caps)				
vi.	Work individually on mathematics problems or applications				
vii.	Work in groups on mathematics problems or applications				
viii.	Do a mathematics activity outside of the classroom (measure the hallway, find the area of the playground)				
ix.	Use technology in the classroom				
x.	Maintain and reflect on a mathematics notebook of their own work				
xi.	Learn vocabulary to help understand math concepts				
xii	Take a quiz or test				

27	When teaching a complete topic, how often do you:	Never	At least 25% of the time	At least 50% of the time	At least 75% of the time	Always
i.	Build on skills children already have and/or know					
ii.	Use real objects, explanations, representations (picture, concrete material, symbol set, etc.) to help pupils understand mathematics problems					
iii.	Use repeated practice to improve pupils' ability to solve matheamtics problems					
iv.	Have pupils do work with and practice grade-level problems and exercises					
v.	Emphasize one solution method to strengthen all pupils' understanding of the content					
vi.	Have pupils choose and use appropriate methods when solving a problem					
vii.	Check for understanding throughout the lesson using informal, but deliberate methods (questioning or assigning short problems)					
viii.	Summarize the mathematics with references to pupil work to reinforce the focus of the lesson					
ix.	Mainly use questions and problems that are from the textbook					
x.	Review standards/topics from previous grades					
xi.	Ask pupils to explain and justify their work					
xii.	Provide feedback to help pupils revise initial work					

28 Assessments:

a Check all type(s) of assessments given.	Check all that apply
i. Tests	
ii. Projects	
iii. Group assignments	
iv. Presentations	
v. Homework	
vi. Classwork	

b How are assessments created?	Check all that apply
i. You create	
ii. Head teacher creates	
iii. School created	
iv. District created	

c When you assess students on a topic what types of questions do you ask?	Check all that apply
i. Calculation	
ii. Application	
iii. Short answer (completing a mathematical procedure)	
iv. Extended response (justify their solution)	

29	When I devlop assessments for pupils, I make changes for students with low pupil English language proficiency.	YES	NO
30	I read problems aloud to pupils who cannot read the assessment.	YES	NO
31	I give questions which require more than a single calculation or can be solved in various ways.	YES	NO

Part D

32	**Put the following pupil learning objectives in order from 1 to 9 with 1 being the most important and 9 being the least important.**	**Order 1 - 9**	(Use each number only once.)
a.	Memorizing mathematical formulas/procedures		
b.	Learning mathematical concepts		
c.	Developing pupils' computational skills		
d.	Learning to reason mathematically		
e.	Learning how to connect mathematics with other subjects		
f.	Learning to explain mathematical ideas		
g.	Learning to apply mathematics in real life		
h.	Learning to perform computations with speed and accuracy		
i.	Preparing for tests like the Basic Education Certificate Examination.		

Part E

33	To be good at mathematics at school, to what extent do you agree or disagree that it is important for pupils to… Check one box in each row.	Strongly disagree	Disagree	Agree	Strongly agree
a.	Remember formulas and procedures				
b.	Think in a step-by-step logical order				
c.	Understand mathematical concepts, principles, and strategies				
d.	Be able to think creatively				
e.	Understand how mathematics is used in the real world				
f.	Be able to provide reasons to support their solutions				

34	To what extent do you agree or disagree with each of the following statements? Check one box in each row.	Strongly disagree	Disagree	Agree	Strongly agree
a.	Mathematics is primarily an abstract subject.				
b.	Mathematics is primarily a formal way of representing the real world.				
c.	Mathematics is primarily a practical and structured guide for addressing real situations.				
d.	If pupils are having difficulty, an effective approach is to give them more practice by themselves during the class.				
e.	Some pupils have a natural talent for mathematics and others do not.				
f.	More than one representation (picture, concrete material, symbol set, etc.) should be used in teaching a mathematics topic.				
g.	Mathematics should be learned as sets of rules that cover all possibilities.				
h.	Basic computational skills on the part of the teacher are sufficient for teaching elementary school mathematics.				
i.	Knowing pupils is essential for teaching mathematics.				

Part F

35	Rate <u>each</u> of the following, from 1 (beginning) to 4 (advanced), on how well *most* of the pupils you teach can do the following in English.	Rate each 1 - 4
a.	Understand basic words and phrases	
b.	Understand simple sentences	
c.	Understand spoken language with ease	
d.	Use simple words to describe familiar things	
e.	Communicate about tasks, topics and routines	
f.	Describe events, experiences and feelings in detail in conversations	
g.	Identify memorized words	
h.	Read very short simple texts	
i.	Read and understand grade level texts fluently	
j.	Write short simple sentences	
k.	Write connected text on familiar topics	
l.	Write clear detailed connected texts on a variety of topics	

36 **How would you explain the differences between the general English word even and the mathematical term even?**

37 **How would you explain the differences between the general English word product and the mathematical term product?**

38 **In what ways do you help pupils learn mathematics vocabulary?**

39 **What are some of the challenges you have in teaching mathematics in English?**

Part G

Scenario 1

After a unit on fractions pupils completed the following in-class assignment. Review the pupil work shown below. Cicle the appropropriate box to demonstrate if the answer is correct or incorrect and then:

Part A. Identify the pupil's correct answers. Circle **C** for correct or **I** for incorrect.
Part B. For **correct** answers explain how the pupil arrived at the solution.
Part C. For **incorrect** answers explain the **pupil's misunderstandings** that could explain their solution and **give correct solution**.
Please see Question 1 as an example.

Homework – Fractions

EX. 1 **Which fraction is larger?**

$\frac{2}{5}$ $\frac{2}{3}$ $\frac{2}{7}$

Pupil's Answer

$\frac{2}{7}$

C	I
	(I)

Correct Answer
$\frac{2}{3}$

Pupil's Misunderstanding: The student misunderstands the concept of the denominator. The larger denominator does not mean that the fraction is the largest. When all of the numerators are the same (as they are here) the larger the denominator the smaller the fraction. The larger the denominiator the more pieces the whole object has been divided in to.

2 **Add the fractions. Give your solution as a proper fraction or mixed number.**

a. $\frac{3}{7}+\frac{6}{7}=$

Pupil's Answer

$\frac{9}{14}$

C	I

Correct Answer

Pupil's Misunderstanding:

3 **Subtract the fraction. Give your solution as a proper fraction or mixed number.**

a. $\frac{3}{4}-\frac{1}{2}=$

Pupil's Answer

$\frac{2}{4}$

C	I

Correct Answer

Pupil's Misunderstanding:

4 **What would be your next steps for this student? Please be specific.**

Scenario 2

After teaching money, pupils completed the following homework assignment. A pupil's work is shown below. Review the pupils' work

Part A. Identify the pupil's correct answers. Circle **C** for correct or **I** for incorrect.

Part B. For **correct** answers explain how the pupil arrived at the solution.

Part C. For **incorrect** answers explain the **pupil's misunderstandings** that could explain their solution and **give correct solution**.

Homework – Money

EX. 1 **Yaw paid GHS 60 for 200 exercise books. He took them to the market and sold them for 65 pesewas each. If he sold 135 exercise books, will Yaw make a profit?**

Pupil's Answer

$200 \div 60 = \frac{200}{60} = 3.33$

$3.33 \times 135 = 449.55$

Yaw made GHS 449.55

C	I

Correct Answer
Yaw sold 135 exercise books at 65 pesewas each. 135 x 0.65 = 87.75 GHS. He paid GHS 60 for his purchase of exercise books and made GHS 87.75. Yaw made a profit of GHS 27.75.

Pupil's Misunderstanding: The pupil did not understand how to calculate unit price of each exercise book. They also did not understand the question was asking for the amount of profit, not the total revenue made for the day. The pupil attempted to calculate the revenue and not the profit. The pupil needs to understand the vocabulary for the money unit, and there differences.

2 **A farmer sold a total of 50 pineapples, 2 baskets of tomatoes and 60 cabbages at the market. The cost of the products are: a pineapple is GHS 1.20, a basket of tomatoes is GHS 13.50 and a cabbage is 80 pesewas. How much did he earn in total?**

Pupil's Answer

$50 + 2 + 70 = 112$

$1.20 + 13.50 + 0.8 = 15.5$

$112 \times 15.5 = 1736$

He made GHS 1736 at the market.

C	I

Correct Answer

Pupil's Misunderstanding:

3 **Akua spent GHS 20 at the store and GHS 1 for the tro-tro each way. She has GHS 35 left after shopping. How much money did Akua have when she left home?**

Pupil's Answer

35 - 20 - 1 - 1 = 13

C	I

Correct Answer

Pupil's Misunderstanding:

4 **Forty – two children signed up to play football. There can be at most 11 children on a team. What is the minimum number of teams can be created?**

Pupil's Answer

$42 \div 11 = 3.8$

The minimum number of teams is 3.

C	I

Correct Answer

Pupil's Misunderstanding:

5 **What would be your next steps for this student? Please be specific.**