



2021 Team Up Challenge

Instructions for Teachers

The Team Up Challenge is designed for students to participate in teams of four. The purpose of the Team Up Challenge is for students and teachers to have fun solving math problems. As such, these instructions should be used as a suggestion only. Teachers should feel free to make modifications in order to suit their class.

Preparing Materials

In advance of running the Team Up Challenge, we recommend teachers prepare each part as indicated below, depending on whether they are teaching in person or virtually. Students may want to use scrap paper and calculators as well.

In Person	
Team Paper	Print one copy of the problems per student and one answer sheet per team.
Crossnumber Puzzle	Print one copy of the puzzle sheet and clue sheets per team.
Logic Puzzle	Print one clue sheet and one answer sheet per student.
Relay	Print one copy of the problems and one answer sheet per team. Cut the problem sheets on the dotted lines.

Virtual	
Answer Sheets	<p>We have Answer Sheet Slides that teams can use to enter their answers for all four parts of the challenge. Note that teachers will need a Google account to set up the slides, but students will <i>not</i> need a Google account to use them. The Answer Sheet Slides can be found here: Answer Sheet Slides.</p> <p>Make a copy of the Answer Sheet Slides for each team. If you do not make a copy, you will not be able to edit the slides. To make a copy, select File > Make a Copy > Entire Presentation. Adjust the name as desired and click 'OK'.</p> <p>Share each team's Answer Sheet Slides with each team member so they can edit the slides. To do this, click 'Share' and then 'Change to anyone with the link'. Then change 'Viewer' to 'Editor' and click 'OK'. Then send the link for each team's slides to all team members. This can all be done in advance as there are no questions on the Answer Sheet Slides.</p>
Team Paper	Send the team paper file to all students when it is time to start.
Crossnumber Puzzle	Send the crossnumber puzzle file to all students when it is time to start.
Logic Puzzle	Send the logic puzzle file to all students when it is time to start. Note that the Answer Sheet Slides contain extra answer sheets for the logic puzzle.
Relay	<p>We have Relay Question Slides that can be used for students to view their relay questions. The slides can be found here: Relay Question Slides.</p> <p>Make a copy of the Relay Question Slides and then share it with each student so they can view (but not edit) the slides. See Answer Sheets instructions for how to make a copy and share it (but <i>do not</i> change 'Viewer' to 'Editor' this time). This can all be done in advance as the questions are initially covered up.</p>



Team Paper: Approximately 30 - 40 minutes

1. The paper contains 15 problems of increasing difficulty. Team members are encouraged to collaborate when solving the problems and should decide on a strategy for sharing the work. It is unlikely that there will be enough time for everyone to do every question.
2. Final answers are to be written on the Team Paper Answer Sheet.

Crossnumber Puzzle: Approximately 20 - 30 minutes

1. The team should divide themselves into two pairs; one pair will take the across clues and the other pair will take the down clues. The team will write their answers on the shared Crossnumber Puzzle Sheet as they work through the puzzle.
2. The crossnumber puzzle is designed so that some clues make it possible to find a number directly, some clues rely on an answer from another clue, and other clues require a partially completed puzzle board. Since each pair within a team is working on a different set of clues, the pairs will need to work together to completely solve the puzzle.
3. If teams are struggling to start the puzzle, teachers can direct them to Across Clues 10, 12, 13, and 22, or Down Clues 9, 15, and 20.

Logic Puzzle: Approximately 20 - 30 minutes

1. Students use the clues to solve the puzzle. Note that the clues are not given in a specific order, and at times students will need to combine the information given in several different clues.
2. Students can work through the puzzle individually, in pairs, or as a team. Answer sheets are provided for all students so team members can work individually and then compare their work in order to find a solution they all agree with.
3. Students are encouraged to use the answer sheet to write any information they know from the clues. This could include putting more than one name in a box, or indicating that two particular boxes must or must not contain the same name. This will help them reach the final answer.
4. If students are struggling to start the puzzle, teachers can direct them to Clues 2, 8, and 1.
5. Teams hand in only one Logic Puzzle Answer Sheet.

Relay: Approximately 5 - 10 minutes per relay

1. The “Practice Relay” is intended to be used as a practice round so students can understand the way the relay works. The questions in the Practice Relay are easier than the rest of the relay questions. Also, Player 1’s questions are the easiest in all relays.



- Each team member is assigned a number: 1, 2, 3, or 4. Each number corresponds to a specific problem in each relay. Players 2, 3, and 4 require the answer from Players 1, 2, and 3, respectively, to solve their problem. This is indicated in the problem with the phrase “Replace N below with the number you receive.” However, Players 2, 3, and 4 should be able to do some work on their problem while they’re waiting for the answer from their teammate.
- The four team members should not see any of the relay problems in advance and should not talk to each other during the relay. The remaining instructions will differ for in-person and virtual classrooms, as shown below.

In Person

- Before the relay starts, each student should have their relay problem face down in front of them.
- Once the relay starts, all players can flip over their paper and start working on their problem. *Even Players 2, 3 and 4 should be able to do some work on their problem right away.*
- When Player 1, Player 2, or Player 3 thinks they have the correct answer to their problem, they record their answer on the answer sheet and pass the sheet to the next player. Students should write only the numeric part of their answer and **not** include any units. When Player 4 thinks they have the correct answer to their problem, they record their answer on the answer sheet and wait for their teacher to check it.
- If all four answers are correct, the relay is complete! Otherwise, the teacher will mark the relay as incorrect and pass the answer sheet back to Player 1 so the team can try again. The answer sheet has space for two attempts for each relay.

Virtual

- Before the relay starts, all students should have the Relay Question Slides open to their relay problem and the Answer Sheet Slides open to the Relay Answer Sheet. *The problems in the Relay Question Slides are covered by boxes that only the teacher can remove.*
- Once the relay starts, the teacher quickly removes the four boxes covering each problem in that relay. At this time, all players can start working on their problem. *Even Players 2, 3 and 4 should be able to do some work on their problem right away.*
- When players think they have the correct answer to their problem, they record their answer on the Answer Sheet Slide so their teammates can see. Students should write only the numeric part of their answer and **not** include any units. After a team has put all four answers on their Answer Sheet Slide, the teacher can check their answers.
- If all four answers are correct, the relay is complete! Otherwise, the teacher will mark the relay as incorrect so the team can try again. The answer sheet has space for two attempts for each relay.



2021 Team Up Challenge

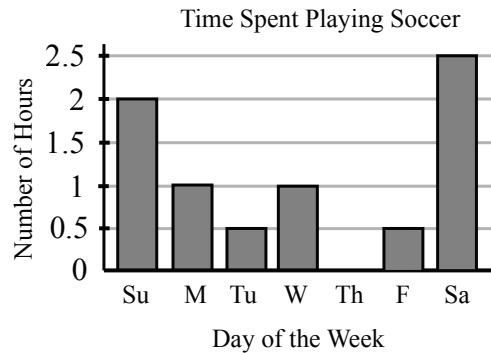
Team Paper



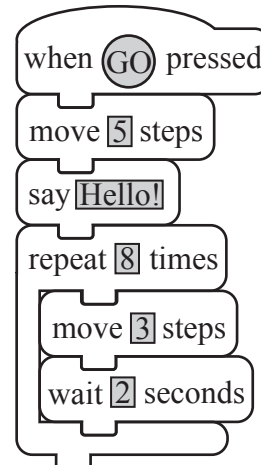
Tips to Get Started

- The questions in this paper increase in difficulty as you move through the paper. The last few questions require some careful thought.
- Each team member doesn't have to do every question. You can split the questions up, work together, or do a combination of both. Come up with a strategy that works for your team.

1. One week, Ana recorded the time she spent playing soccer on the bar graph shown. How many hours, in total, did she spend playing soccer that week?

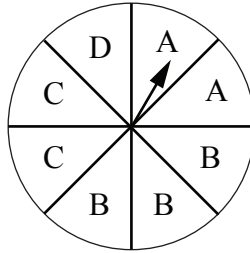


2. A square has a perimeter of 12 cm. What is the side length of the square?
3. If the symbol \triangle represents the number 5, what is the value of $\triangle \times \triangle + \triangle$?
4. Alia wrote the code shown for a character in her animation. After running the code once, how many steps did the character move?





- Jeff can type 40 words per minute. How many minutes would it take to him to type a 5000 word essay?
- A spinner is divided into 8 equal sections. The arrow is spun one time. What is the probability that the arrow will land on a section marked with the letter B?

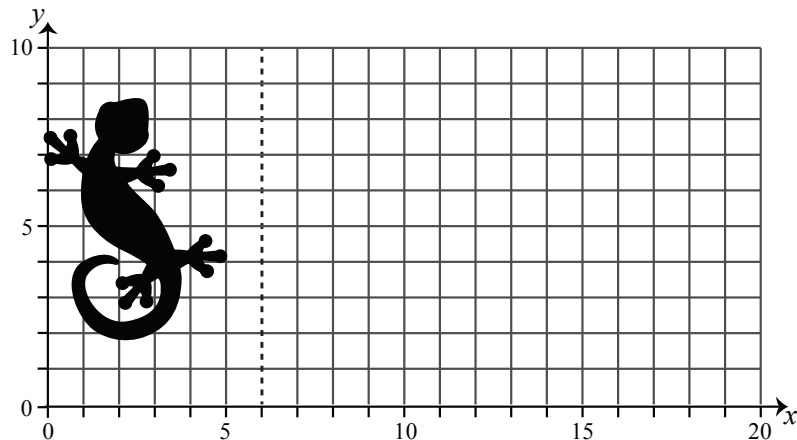


- How many prime numbers are there between 6 and 30?
- A triangular prism has exactly five faces and nine edges. How many vertices does a triangular prism have?
- A sequence of six shapes repeats to form the following pattern:



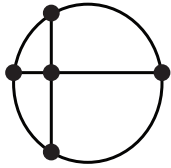
What is the 55th shape of the pattern?

- A lizard silhouette is placed on a grid so that the end of its tail has the coordinates (2, 4). The lizard is then reflected over the dashed vertical line through (6, 0) and then translated 7 units to the right. What are the new coordinates of the end of the lizard's tail?

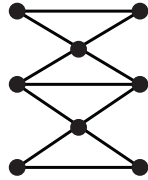




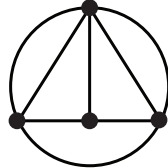
11. For which of the following five pictures is it possible to trace over every line exactly once, moving from dot to dot without lifting your pencil?



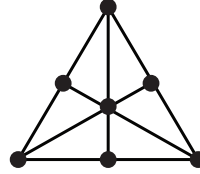
Picture A



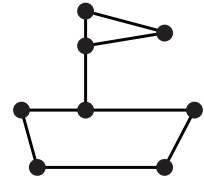
Picture B



Picture C



Picture D



Picture E

12. In the following list of numbers, the symbol \square represents an unknown number.

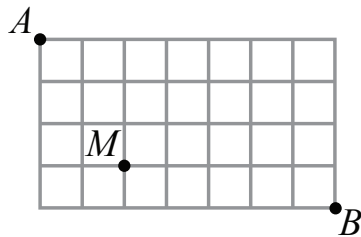
$$3, \square, 6, 5, 2, 9$$

If the median and mode of the list are equal, what is the unknown number?

13. Jonah's favourite number is a positive integer. One day, he decided to write down all of the positive integers starting at 1 and ending with his favourite number. He noticed, in doing so, that he wrote the digit 7 exactly 30 times. What is Jonah's favourite number?
14. Hans is in a room with seven other people. Each person in the room was asked how many of the other seven people they had met before. Given the responses of the other seven people, how many people in the room has Hans met before?

Person's Name	Amad	Bea	Cho	Diane	Edgar	Foster	Gene
Number of People They Met Before	5	7	4	7	3	3	7

15. In a video game, a robot is programmed to walk from A to B along the gridlines. The robot can only move right or down and must travel through the point M.



How many different paths from A to B can the robot take?



2021 Team Up Challenge Team Paper Answer Sheet

Team: _____

Question	Answer
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	



2021 Team Up Challenge

Crossnumber Puzzle

Team: _____

1				2		3			4			5
			6			7						
8	9								10			
												11
12												
						15						
	16	17							18			19
20			21									
22												
					23						24	



Tips to Get Started

- This puzzle is like a crossword puzzle, with across clues and down clues. Your team will work together, with some of you solving the across clues and some solving the down clues.
- Start by looking for clues that can be solved right away. Then move on to the clues that rely on an answer from another clue.



2021 Team Up Challenge

Across Clues

1. The range of 22 ACROSS and 19 DOWN.
2. 50% of 10 ACROSS.
4. The number that should replace ■ when $\frac{23}{\text{span style="border: 1px solid black; padding: 2px;">12 DOWN}} = \frac{\text{span style="border: 1px solid black; padding: 2px;">\blacksquare}}{648}$.
7. A multiple of 109.
8. The sum of 110 and 4 ACROSS.
10. The total number of days in July and August.
12. The result when 45 is multiplied by itself and added to 30.
13. The product of 12 and 94.
16. A factor of 8 ACROSS.
18. A number that is the same when its digits are written in the reverse order.
21. A number whose middle digit is the median of its other two digits.
22. Seventeen dozen.
23. A number whose digits add to the sum of the digits in 13 ACROSS.
24. The smallest prime number greater than 16 ACROSS.



2021 Team Up Challenge

Down Clues

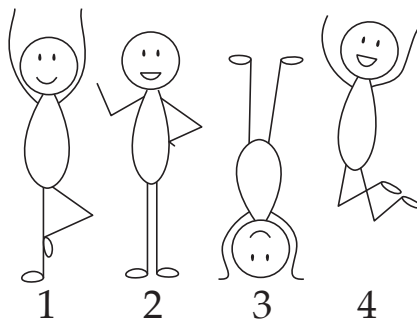
- The number that is 5 more than 16 times .
- The number that is $\frac{4}{5}$ of .
- A number whose digits sum to 16.
- An odd multiple of 5.
- The length of a rectangle with area and width .
- The sum of the four angles (in degrees) in a square.
- The number that is 6 more than .
- A multiple of 8.
- The digits of written in the reverse order.
- Thirty-five more than the largest 3-digit multiple of 7.
- The mean of and .
- The positive difference between and .
- The number of weeks that are equal to days.
- The value of $14 + 0.5 \times 36$.



2021 Team Up Challenge

Logic Puzzle

Four siblings take group selfies in five different locations around their house. In each selfie all four siblings are standing in a line. Their positions are numbered 1 through 4 as shown in the image.



Read the clues below to determine in which order the siblings are standing for each selfie. Complete the table with the name of each person for each photo location and position.

- (1) Blanche is standing in Position 1 in four of the five photos.
- (2) Dorothy and Sophia are the only people to ever stand in Position 2.
- (3) Rose is standing in the same position for the photos in the basement and the driveway, but she isn't standing in that position in any other photos.
- (4) Dorothy is never standing in Position 1 or Position 4.
- (5) Sophia is standing in Position 2 exactly twice.
- (6) The four siblings are standing in the same order for the photos in the park and the kitchen.
- (7) In three of the four photos where Blanche is standing in Position 1, Dorothy is standing next to her.
- (8) The order for the garden photo is the reverse of the order for the driveway photo.



Tips to Get Started

- Don't wait until you know a person's exact position to write their name in the table. Use the table to write any helpful information from the clues, such as putting more than one name in a box, or indicating that two particular boxes must or must not contain the same name.
- Note that the clues are not given in a specific order, and at times you will need to combine the information given in several different clues.



2021 Team Up Challenge Logic Puzzle Answer Sheet

Team: _____

Complete the table with the name of each person for each photo location and position.

		Position in Photo			
		1	2	3	4
Location	Park				
	Kitchen				
	Garden				
	Driveway				
	Basement				

Practice Relay - Player 1

What is $2 + 0 + 2 + 1$?

Practice Relay - Player 2

Replace N below with the number you receive.
How many of the following numbers are even?

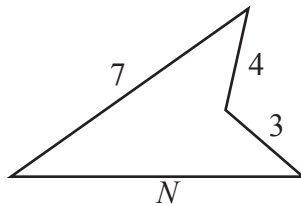
16, 29, 450, 34, 11, N



You can start working on this question while you're waiting for Player 1's answer.

Practice Relay - Player 3

Replace N below with the number you receive.
Calculate the sum of all the side lengths in the shape shown below.



You can start working on this question while you're waiting for Player 2's answer.

Practice Relay - Player 4

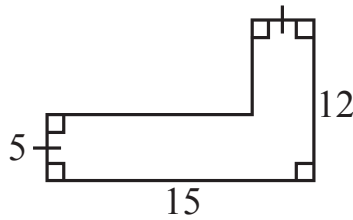
Replace N below with the number you receive.
There are N people on a bus. At the first stop 2 people get off the bus. At the second stop 9 people get on the bus. How many people are on the bus after the second stop?



You can start working on this question while you're waiting for Player 3's answer.

Relay A - Player 1

Calculate the area of the following shape.



Relay A - Player 2

Replace N below with the number you receive.

Ann is delivering newspapers. Two thirds of the way through her deliveries she has delivered N newspapers. How many newspapers did she deliver in total?



You can start working on this question while you're waiting for Player 1's answer.

Relay A - Player 3

Replace N below with the number you receive.

When the numbers in the following list are arranged in increasing order, what is the middle number?

123, 156, 92, 196, 103, 99, 62, 45, 101, 78, N



You can start working on this question while you're waiting for Player 2's answer.

Relay A - Player 4

Replace N below with the number you receive.

A musician gives away free hats at her concerts. One day she had 3 concerts and started with a large number of hats. At the first concert she gave away half of her hats. At the second concert she gave away half of the remaining hats. At the third concert she gave away half of the remaining hats. At the end of the day she had N hats left. How many hats did she start with that day?



You can start working on this question while you're waiting for Player 3's answer.

Relay B - Player 1

The table shows the ages of all the children in the Gauss Choir. How many of the children are older than 7?

Age	Number of Children
6	8
7	10
8	7
9	2

Relay B - Player 2

Replace N below with the number you receive.

Pierre has two \$1 coins, one \$2 coin, two \$5 bills, and four \$10 bills. If he divides this money equally among N people, how many dollars does each person get?



You can start working on this question while you're waiting for Player 1's answer.

Relay B - Player 3

Replace N below with the number you receive.

The first term in a sequence is 5. The second term is 7. Each term after that is found by adding the two previous terms. So the third term would be $5 + 7 = 12$. What is the N^{th} term in this sequence?



You can start working on this question while you're waiting for Player 2's answer.

Relay B - Player 4

Replace N below with the number you receive.

Zaida has 3 pieces of rope measuring 43 cm, 0.9 m, and N mm. What is the total length of her rope pieces, in cm?



You can start working on this question while you're waiting for Player 3's answer.

Relay C - Player 1

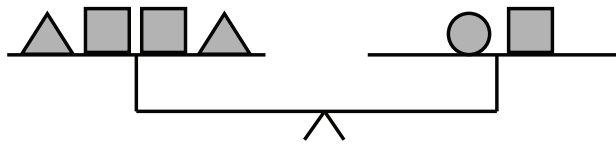
How many of the following numbers are less than 45.63?

45.93, 45.77, 45.71, 45.61, 45.6, 45.7, 45.56, 45.1, 45.53

Relay C - Player 2

Replace N below with the number you receive.

In the diagram, an equal-armed balance is shown. The mass of each triangle is 4 grams, and the mass of each square is N grams. What is the mass (in grams) of the circle?



You can start working on this question while you're waiting for Player 1's answer.

Relay C - Player 3

Replace N below with the number you receive.

Magda is 4 years old, Kostas is 6 years old, and Spiro is 8 years old. In N years, what will the sum of their ages be?



You can start working on this question while you're waiting for Player 2's answer.

Relay C - Player 4

Replace N below with the number you receive.

Fatemah writes the following sentence N times.

She sells sea shells by the sea shore.

How many more times does she write the letter "S" than the letter "L" (either capital or lowercase)?



You can start working on this question while you're waiting for Player 3's answer.



2021 Team Up Challenge

Relay Answer Sheet

Team: _____

Practice Relay					
	Player 1	Player 2	Player 3	Player 4	Teacher
1 st Attempt					
2 nd Attempt					

Relay A					
	Player 1	Player 2	Player 3	Player 4	Teacher
1 st Attempt					
2 nd Attempt					

Relay B					
	Player 1	Player 2	Player 3	Player 4	Teacher
1 st Attempt					
2 nd Attempt					

Relay C					
	Player 1	Player 2	Player 3	Player 4	Teacher
1 st Attempt					
2 nd Attempt					