

TCAP/CRA 2012-2013



Task 4: Basketball Schedule Task Full Scoring Guide

Task 4. Basketball Schedule Task

Lori, Brad, and Dave play basketball at the same gym. Lori’s team plays basketball every 2nd day, Brad’s team plays basketball every 3rd day, and Dave’s team plays basketball every 4th day. Here is their schedule for the first 20 days of the season.

Day 1	Day 2 Lori	Day 3 Brad	Day 4 Lori <u>Dave</u>	Day 5	Day 6 Lori Brad	Day 7	Day 8 Lori <u>Dave</u>	Day 9 Brad	Day 10 Lori
Day 11	Day 12 Lori <u>Dave</u> Brad	Day 13	Day 14 Lori	Day 15 Brad	Day 16 Lori <u>Dave</u>	Day 17	Day 18 Lori Brad	Day 19	Day 20 Lori <u>Dave</u>
Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30


Dave underlined every time he plays at the gym. He noticed the following:

- He sees Lori *every* time his team plays basketball.
- He sees Brad *only 1 time* – on Day 12.
- He sees both Brad and Lori on Day 12.

Dave doesn’t understand the patterns in the schedule.



- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.



A large rectangular box for writing the answer to question a. In the top-left corner, there is a small icon of a hand holding a pen, indicating where to start writing.

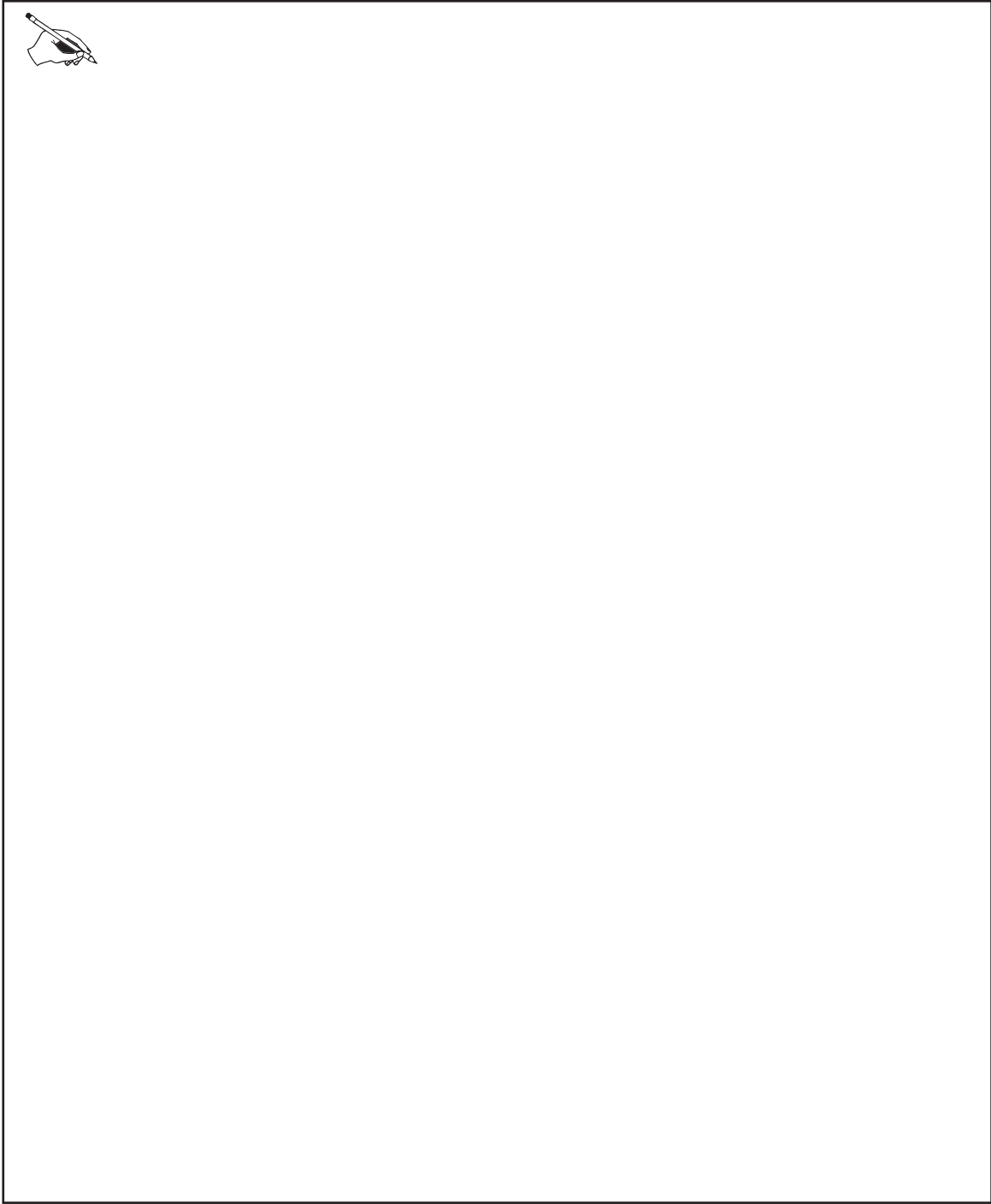
- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.



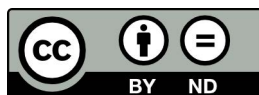
A large rectangular box for writing the answer to question b. In the top-left corner, there is a small icon of a hand holding a pen, indicating where to start writing.



c. Show how your explanation helps predict the next day when all 3 will play on the same day.



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4. Basketball Schedule Task Scoring Guide

The CCSS for Mathematical Content (2 points)

- 3.OA.3 The student provides multiplication or division equations and/or expressions, or a written explanation that indicates that the student makes sense of the basketball schedule as it relates to multiplication or division. The student may indicate this by: _____
- writing about the schedule of dates for players and how the date that each player plays is predictable since the repeating pattern for each player is known.
 - recording multiplication or division equations that reference the repeated pattern of 2, 3, or 4 multiplied by number of days of play results in a date on the schedule.
- 3.OA.9 The student provides evidence of understanding that the students' schedule represents a pattern of play. The student may do this by: _____
- explaining or showing that all three students will play on the 12th day because 2×6 , 3×4 , and 4×3 each have a product of 12.
 - writing a list of multiplication tables for 2, 3, or 4 and identifying the product of 12 for all three students.

Total Content Points _____

The CCSS for Mathematical Practice (4 points)

MP1 The student provides an explanation or multiplication equations indicating that an association exists between multiplication and dates on the schedule. The student also provides some evidence of testing the claim that multiples predict schedules of players. _____

(MP1: Make sense of problems and persevere in solving them.)

MP2 The student writes equations and contextualizes the equations by providing labels or an explanation that indicates the relationship of the equations to the context of the situation. _____

(MP2: Reason abstractly and quantitatively.)

MP3 The student indicates support for Lori’s claim that multiplication helps to interpret the schedule, and uses mathematics and reasoning to show that the pattern of “who plays when” is evident via multiplication. _____

(MP3: Construct viable arguments and critique the reasoning of others.)

MP7 The student shows work indicating understanding of the structure of numbers. The student may do this by: _____

- indicating how multiplication by 2, 3, or 4 explains the patterns of the basketball schedule.
- showing repeated addition of 2s, 3s, or 4s and explaining the patterns of the basketball schedule.

(MP7: Look for and make use of structure.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

Represent and solve problems involving multiplication and division.

3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

The CCSS for Mathematical Practice*

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

*Gray text indicates Mathematical Practices that are not addressed in this task.

Students' responses to a mathematical task provide evidence of what they understand and are able to do in relation to the standards and practices. Across tasks, this cumulative evidence shows students' understanding and abilities within a domain. When students do not respond completely to all parts of a task, they provide insufficient evidence of their mathematical understanding and abilities and therefore do not fully demonstrate the expectations of the standards and practices aligned with that task.

Task 4. Basketball Schedule Task

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Day 1	Day 2 Lori	Day 3 Brad	Day 4 Lori <u>Dave</u>	Day 5	Day 6 Lori Brad	Day 7	Day 8 Lori <u>Dave</u>	Day 9 Brad	Day 10 Lori
Day 11	Day 12 Lori Dave Brad	Day 13	Day 14 Lori	Day 15 Brad	Day 16 Lori <u>Dave</u>	Day 17	Day 18 Lori Brad	Day 19	Day 20 Lori <u>Dave</u>
Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30

Dave underlined every time he plays at the gym. He noticed the following:


- He sees Lori *every time* his team plays basketball.
- He sees Brad *only 1 time* – on Day 12.
- He sees both Brad and Lori on Day 12.

Dave doesn't understand the patterns in the schedule.

- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.

 Dave will always see Lori because Lori plays on the days that are multiples of 2 and Dave plays on days that are a multiple of 4. 4 is a multiple of 2.
 $2 \times 2 = 4$

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.

 All three play on 12 because 12 is a multiple of 2, 4, and 3.
 $2 \times 6 = 12$ $3 \times 4 = 12$ $4 \times 3 = 12$

- c. Show how your explanation helps predict the next day when all 3 will play on the same day.

➤ Dave, Lori, and Brad
will play on 24 together.

I know because all
of them meet on the
12th which means
that all together
they meet on the
12th, and they'll meet
again on the 24th
because it's counting
by 12's.



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Guide 1

Litho 1903

Total Content Points: 2 (3.0A.3, 3.0A.9)

Total Practice Points: 4 (MP1, MP2, MP3, MP7)

This response indicates that the student makes sense of the basketball schedule as it relates to multiplication by recording 3 multiplication equations in Part B ($2 \times 6 = 12$, $3 \times 4 = 12$, $4 \times 3 = 12$) that reference the repeated pattern of 2, 3, or 4 multiplied by the number of days of play, resulting in a date on the schedule (3.0A.3). In addition, these equations provide evidence of understanding that the students' schedule represents a pattern of play by showing that all 3 students will play on the 12th day (3.0A.9). Thus the student provides an explanation that an association exists between multiplication and dates on the schedule, which also demonstrates an understanding of the structure of numbers (MP1, MP7). The student supports Lori's claim that Dave will always see Lori every time he plays because Lori plays on every multiple of 2 and Dave on every multiple of 4, and 4 is a multiple of 2 (MP3). The student writes equations in Part B and contextualizes them in Part C by explaining "they meet on the 12th and the'll [they'll] meet again on the 24th because it's counting by 12's" (MP2).

Total Awarded Points: 6 out of 6

Task 4. Basketball Schedule Task

Lori, Brad, and Dave play basketball at the same gym. Lori's team plays basketball every 2nd day, Brad's team plays basketball every 3rd day, and Dave's team plays basketball every 4th day. Here is their schedule for the first 20 days of the season.

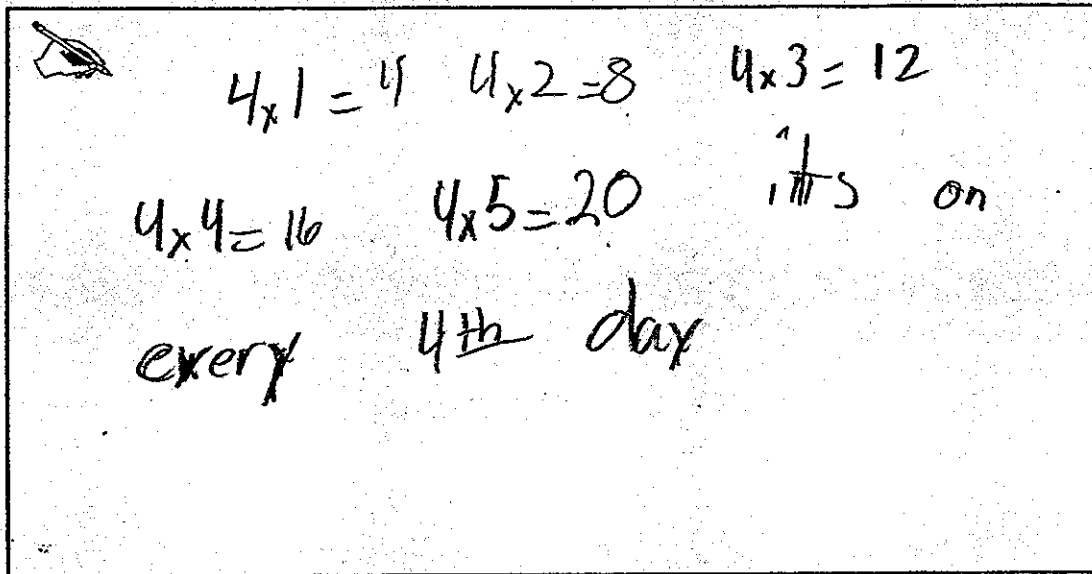
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Dave underlined every time he plays at the gym. He noticed the following:

- He sees Lori every time his team plays basketball.
- He sees Brad *only 1 time* – on Day 12.
- ⓪ He sees both Brad and Lori on Day 12.

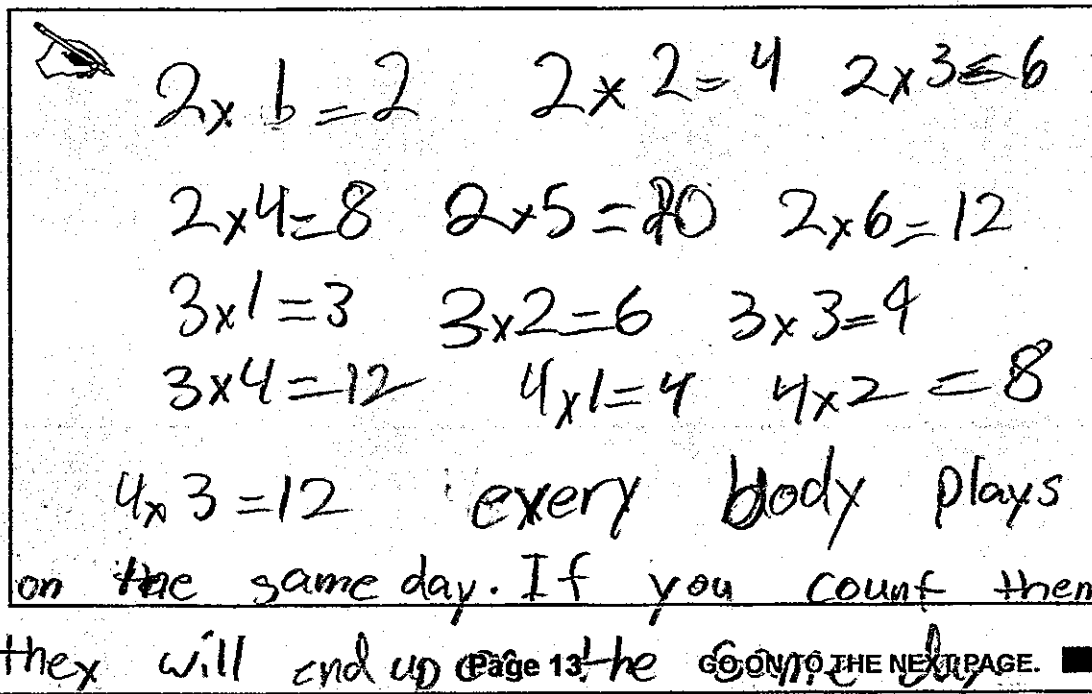
Dave doesn't understand the patterns in the schedule.

- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.



$4 \times 1 = 4$ $4 \times 2 = 8$ $4 \times 3 = 12$
 $4 \times 4 = 16$ $4 \times 5 = 20$ $4 \times 6 = 24$
 every 4th day

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.



$2 \times 6 = 12$ $2 \times 2 = 4$ $2 \times 3 = 6$
 $2 \times 4 = 8$ $2 \times 5 = 10$ $2 \times 6 = 12$
 $3 \times 1 = 3$ $3 \times 2 = 6$ $3 \times 3 = 9$
 $3 \times 4 = 12$ $4 \times 1 = 4$ $4 \times 2 = 8$
 $4 \times 3 = 12$ every body plays
 on the same day. If you count them
 they will end up on the same day.

c. Show how your explanation helps predict the next day when all 3 will play on the same day.



Since there are

12 days they played

on the next 12 days

will be on the

24th,



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Guide 2

Litho 1864

Total Content Points: 2 (3.0A.3, 3.0A.9)

Total Practice Points: 4 (MP1, MP2, MP3, MP7)

This response indicates that the student makes sense of the basketball schedule as it relates to multiplication in Part B by recording multiplication equations that reference the repeated patterns of 2, 3, and 4 (3.0A.3). By writing a list of multiplication tables and extending those patterns to the point where they all equal 12, the student provides evidence of understanding that the schedule represents a pattern of play (3.0A.9). Thus, the student provides an explanation that an association exists between multiplication and dates on the schedule (MP1), which also demonstrates an understanding of the structure of numbers (MP7). Furthermore, this work in Part B indicates support for Lori's claim that multiplication helps to interpret the schedule by determining the friends will all play on the 12th day (MP3). The student contextualizes in Part C by explaining, "Sence there are 12 day they played on the next 12 days will be on the 24th" (MP2).

Total Awarded Points: 6 out of 6

Task 4. Basketball Schedule Task

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Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30

Dave underlined every time he plays at the gym. He noticed the following:


- He sees Lori every time his team plays basketball.
- He sees Brad *only 1 time* – on Day 12.
- ⓪ He sees both Brad and Lori on Day 12.

Dave doesn't understand the patterns in the schedule.

- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.


 Lori starts the season on day 2, 4, 6, 8, 10, 12, 14, 16, 18, 20. Dave goes on the 4, 8, 12, 16, 20. If you look they both go those days

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.


 $2 \times 6 = 12$ (Lori) $3 \times 4 = 12$ (Brad) $4 \times 3 = 12$ (Dave)

Lori goes 2, 4, 6, 8, 10, 12, 14, 16, 18, 20. Brad goes 3, 6, 9, 12, 15, 18. Dave goes 4, 8, 12, 16, 20.

c. Show how your explanation helps predict the next day when all 3 will play on the same day.

 The 24th, every 12 days
they all play.



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Guide 3

Litho 2051

Total Content Points: 2 (3.0A.3, 3.0A.9)

Total Practice Points: 3 (MP1, MP2, MP7)

In Part A, the student shows the sequence of days that Lori and Dave will play (2, 4, . . . 20; 4, 8, . . . 20) but does not clearly relate those sequences to construct a viable argument in support of Lori's claim (no credit for MP3). This response indicates that the student makes sense of the basketball schedule as it relates to multiplication, recording 3 multiplication equations in Part B ($2 \times 6 = 12$, $3 \times 4 = 12$, $4 \times 3 = 12$) that reference that the repeated pattern of 2, 3, or 4 multiplied by the number of days of play results in a date on the schedule (3.0A.3). In addition, these equations provide evidence of understanding that the students' schedule represents a pattern of play by showing that all 3 students will play on the 12th day (3.0A.9). Thus, the student provides an explanation that an association exists between multiplication and dates on the schedule (MP7), which also demonstrates an understanding of the structure of numbers (MP1). The student contextualizes the work shown by stating in Part C that the three students will all play every 12 days (MP2).

Total Awarded Points: 5 out of 6

Task 4. Basketball Schedule Task

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Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30

Dave underlined every time he plays at the gym. He noticed the following:

- He sees Lori *every time* his team plays basketball.
- He sees Brad *only 1 time* – on Day 12.
- He sees both Brad and Lori on Day 12.


Dave doesn't understand the patterns in the schedule.

- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.

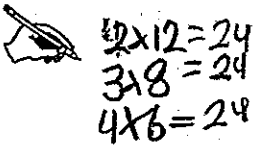

$$\begin{array}{l} 2 \times 2 = 4 \\ 4 \times 1 = 4 \\ 2 \times 4 = 8 \\ 4 \times 2 = 8 \end{array}$$

it is the same

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.


$$\begin{array}{l} 2 \times 6 = 12 \\ 3 \times 4 = 12 \\ 4 \times 3 = 12 \end{array}$$

c. Show how your explanation helps predict the next day when all 3 will play on the same day.



$2 \times 12 = 24$
 $3 \times 8 = 24$
 $4 \times 6 = 24$



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Guide 4

Litho 8470

Total Content Points: 2 (3.0A.3, 3.0A.9)

Total Practice Points: 2 (MP1, MP7)

This response indicates that the student makes sense of the basketball schedule as it relates to multiplication by recording 3 multiplication equations in Part B ($2 \times 6 = 12$, $3 \times 4 = 12$, $4 \times 3 = 12$) that reference that the repeated pattern of 2, 3, or 4 multiplied by the number of days of play results in a date on the schedule (3.0A.3). In addition, these equations provide evidence of understanding that the students' schedule represents a pattern of play by showing that all 3 students will play on the 12th day (3.0A.9). Thus, the student provides an explanation that an association exists between multiplication and dates on the schedule (MP1), which also demonstrates an understanding of the structure of numbers (MP7). In Part A, the student shows 4 equations, but needs to clearly explain their meaning in order to construct a viable argument in support of Lori's claim (no credit for MP3). Though there are equations in Part C, each showing a product of 24, there is no labeling and no explanation indicating the relationship of the equations to the context of the situation (no credit MP2).

Total Points Awarded: 4 out of 6

Task 4. Basketball Schedule Task

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Dave underlined every time he plays at the gym. He noticed the following:


- He sees Lori every time his team plays basketball.
- He sees Brad *only 1 time* – on Day 12.
- He sees both Brad and Lori on Day 12.

Dave doesn't understand the patterns in the schedule.


- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.

 the reason that they play on the same day is like Lori said hers can be found by multiplying 2 and 2 is half of 4 so Lori has practice on the second day and then has practice again 2 days later an $2+2=4$

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.

 they all play together because 2, 4, and 3 are all multiples of (12)

- c. Show how your explanation helps predict the next day when all 3 will play on the same day.

 they will all play again
on the 24th because
 $2 \times 12 = 24$ and $4 \times 6 = 24$
and the $3 \times 8 = 24$
and then



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Guide 5

Litho 1919

Total Content Points: 2 (3.0A.3, 3.0A.9)

Total Practice Points: 1 (MP2)

This response indicates that the student makes sense of the basketball schedule as it relates to multiplication by providing a written explanation that, although the terminology is incorrect (multiples), shows some understanding 2, 3, and 4 are factors of 12 (3.0A.3). This also provides evidence of understanding that the students' schedule represents a pattern of play by showing all 3 students play on the 12th (3.0A.9). However, the student's work in Part B does not provide sufficient evidence of testing the claim that multiples predict schedules of players or of understanding the structure of the numbers (no credit for MP7, no credit for MP1). The student shows equations in Part C determining when all 3 will next play on the same day, and by providing labels in Part A ("...practice of the second day...2 days later") and mentioning the 24th in Part C, the student indicates the relationship of the equations to the context of the situation (MP2). In Part A the student discusses that Lori will have practice on the 2nd and 4th days but never mentions Dave's schedule, and consequently does not determine if Dave will always see Lori when he plays, therefore not supporting Lori's claim (no credit for MP3).

Total Points Awarded: 3 out of 6

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- He sees Lori every time his team plays basketball.
- He sees Brad *only 1 time* – on Day 12.
- He sees both Brad and Lori on Day 12.

Dave doesn't understand the patterns in the schedule.


- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.

 She's is right because $2 \times 4, 6, 8, \dots$ it's going by 2.

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.

 Dave: 4, 8, 12.
Lori: 2, 4, 6, 8, 10, 12
Brad: 3, 6, 9, 12

c. Show how your explanation helps predict the next day when all 3 will play on the same day.

 They all will play on the 24 because.

Dave: 4, 8, 12, 16, 20, 24

Lori: 12, 14, 18, 20, 22, ~~24~~

Brad: 12, 15, 18, 21, 24



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Guide 6

Litho 2069

Total Content Points: 1 (3.0A.9)

Total Practice Points: 2 (MP1, MP7)

This response provides no equations or written explanation to indicate that the student makes sense of the basketball schedule as it relates to multiplication or division (no credit for 3.0A.3). However, evidence of understanding that the students' schedule represents a pattern of play is provided by the lists shown in Part B of multiples of 2, 3, and 4, each list going up to 12 (3.0A.9). The work in Part C, where the lists of repeated addition are extended to 24, provides evidence of testing the claim that multiples predict the schedules of players and indicates an understanding of the structure of numbers (MP7, MP1). The work shown in Part A ignores Dave's schedule and is insufficient to determine if Dave will always see Lori when he plays, and therefore cannot support Lori's claim that multiplication helps interpret the schedule (no credit for MP3). The student neither writes equations nor explains any of the numbers in the context of the problem (no credit for MP2).

Total Awarded Points: 3 out of 6

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Dave underlined every time he plays at the gym. He noticed the following:

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- He sees Brad *only 1 time* – on Day 12.
- He sees both Brad and Lori on Day 12.


Dave doesn't understand the patterns in the schedule.

Everyone has a different schedule than his and he sees Lori all the time because their schedule is in even numbers and Brad's is in odd.

- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.


 Lori is counting by twos and Dave is counting by 4's
 2 4 6 8 10 12 14 16
 DAVE DAVE DAVE DAVE
 so Dave's is sorta like counting by twos.

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.


 Because Daves and Lori's acully go to 12 | Daves | Lori's | Brad's
 4 8 12 | 2 4 6 8 12 | 3 6 9 12
 and so does Brad

c. Show how your explanation helps predict the next day when all 3 will play on the same day.

✍ On the 12th day they
will see

Dave	4	8	12
Lori	2	4	6
Brad	3	6	9

↙



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Guide 7

Litho 1963

Total Content Points: 1 (3.0A.9)

Total Practice Points: 1 (MP7)

This response provides no equations or written explanation to indicate that the student makes sense of the basketball schedule as it relates to multiplication or division (no credit for 3.0A.3). However, evidence of understanding that the students' schedule represents a pattern of play is provided by the lists shown in Part B of multiples of 2, 3, and 4, each going up to 12 (3.0A.9). The repeated additions in Part B indicate an understanding of the structure of numbers (MP7). However, the student does not predict when all 3 will play again on the same day in Part C, and therefore does not indicate that an association exists between multiplication and dates on the schedule (no credit for MP1). The work in Part A is not sufficient to support Lori's claim that multiplication helps to interpret the schedule because it does not clearly show that Dave will always see Lori when he plays (no credit for MP3). The student neither writes equations nor explains any of his numbers in the context of the problem (no credit MP2).

Total Awarded Points: 2 out of 6

Task 4. Basketball Schedule Task

Lori, Brad, and Dave play basketball at the same gym. Lori's team plays basketball every 2nd day, Brad's team plays basketball every 3rd day, and Dave's team plays basketball every 4th day. Here is their schedule for the first 20 days of the season.

Day 1	Day 2 Lori	Day 3 Brad	Day 4 Lori <u>Dave</u>	Day 5	Day 6 Lori Brad	Day 7	Day 8 Lori <u>Dave</u>	Day 9 Brad	Day 10 Lori
Day 11	Day 12 Lori <u>Dave</u> Brad	Day 13	Day 14 Lori	Day 15 Brad	Day 16 Lori <u>Dave</u>	Day 17	Day 18 Lori Brad	Day 19	Day 20 Lori <u>Dave</u>
Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30


Dave underlined every time he plays at the gym. He noticed the following:

- He sees Lori every time his team plays basketball.
- He sees Brad *only 1 time* – on Day 12.
- He sees both Brad and Lori on Day 12.


Dave doesn't understand the patterns in the schedule.

He should not he got every team right the 12 probably DOES but Lori, Brad, Dave should meet there


- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.

 ~~Yes~~ but he will see her a lot because 4 he will see her and 8th and every 4 day after because they are even numbers. So he will see her every same

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.

 because you can multiply your number up you all land on 12 so you all see each other because so they all multiply up and all get to see them on the 12.

c. Show how your explanation helps predict the next day when all 3 will play on the same day.

 the 13th because at the end of the month will play the 1st of the month. The 1st of the month.



REVIEW YOUR WORK IF YOU HAVE TIME.

Guide 8

Litho 1927

Total Content Points: 1 (3.0A.3)

Total Practice Points: 0

This response indicates that the student makes some sense of the basketball schedule as it relates to multiplication by explaining in Part A that “because 4 he will see her and 8th and every 4 day after beacus they are even numbers. So he will see her every game,” and noting in Part B that multiplication is used to predict the dates played. Thus, the student shows that the dates each player plays is predictable, since the repeating pattern for each player is known (3.0A.3). By not showing that all three students will play on the 12th, the student does not provide sufficient evidence of understanding that the students’ schedule represents a pattern of play (no credit for 3.0A.9). The lack of demonstrating this and the incorrect response in Part C indicate a lack of understanding that an association exists between multiplication and dates in the schedule (no credit for MP1). Furthermore, with no equations being provided, the student is unable to indicate the relationship of equations to the context of the problem (no credit for MP2). The explanation to support Lori’s claim only addresses Dave’s playing every 4 days and needs to also address Lori’s schedule to be viable (no credit for MP3). Overall, the response shows insufficient work to indicate an understanding of the structure of numbers (no credit for MP7).

Total Awarded Points: 1 out of 6

Task 4. Basketball Schedule Task

Lori, Brad, and Dave play basketball at the same gym. Lori's team plays basketball every 2nd day, Brad's team plays basketball every 3rd day, and Dave's team plays basketball every 4th day. Here is their schedule for the first 20 days of the season.


Day 1	Day 2 Lori	Day 3 Brad	Day 4 Lori <u>Dave</u>	Day 5	Day 6 Lori Brad	Day 7	Day 8 <u>Lori</u> <u>Dave</u>	Day 9 Brad	Day 10 Lori
Day 11	Day 12 Lori Dave Brad	Day 13	Day 14 Lori	Day 15 Brad	Day 16 Lori <u>Dave</u>	Day 17	Day 18 Lori Brad	Day 19	Day 20 Lori <u>Dave</u>
Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30

Dave underlined every time he plays at the gym. He noticed the following:


- He sees Lori every time his team plays basketball.
- He sees Brad only 1 time – on Day 12.
- He sees both Brad and Lori on Day 12.

Dave doesn't understand the patterns in the schedule.


- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.

 $2 \times 2 = 4$ she plays on two days
 $2 + 2 = 4$ and he plays on 4 day
 they play on the same day

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.

 Lori plays on two day and 2 is even
 and 12 is even that's how she got play
 on 12 and Brad plays on 3 day
 and 12 is a multiple of three and Dave
 got to play on 4 because $4 \times 3 = 12$ and 4 is multiple
 of 4 $4 + 4 = 12$ 2 3 and 4 all are
 multiples.

c. Show how your explanation helps predict the next day when all 3 will play on the same day.

 They will play on the day
22/08/00



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Guide 9

Litho 8455

Total Content Points: 1 (3.0A.9)

Total Practice Points: 0

Nowhere in this response does the student provide multiplication equations or a written explanation that indicates the student makes sense of the basketball schedule (no credit for 3.0A.3, no credit for MP2). This response does provide some reasoning in Part B explaining that all 3 students will play on the 12th day and indicating that 12 is a multiple of 2, 3, and 4 (3.0A.9). Having Parts A and B incorrect indicates the student does not show evidence of making sense of the problem (no credit for MP1). The explanation in Part A is incorrect, since Lori and Dave do not always play on the same days (no credit for MP3). The student says that $8 + 4 = 12$, which has nothing to do with the multiplication patterns needed to determine the basketball schedule (no credit for MP7).

Total Awarded Points: 1 out of 6

Task 4. Basketball Schedule Task

Lori, Brad, and Dave play basketball at the same gym. Lori's team plays basketball every 2nd day, Brad's team plays basketball every 3rd day, and Dave's team plays basketball every 4th day. Here is their schedule for the first 20 days of the season.

Day 1	Day 2 Lori	Day 3 Brad	Day 4 Lori <u>Dave</u>	Day 5	Day 6 Lori Brad	Day 7	Day 8 Lori <u>Dave</u>	Day 9 Brad	Day 10 Lori
Day 11	Day 12 Lori <u>Dave</u> Brad	Day 13	Day 14 Lori	Day 15 Brad	Day 16 Lori <u>Dave</u>	Day 17	Day 18 Lori Brad	Day 19	Day 20 Lori <u>Dave</u>
Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30

Dave underlined every time he plays at the gym. He noticed the following:

- He sees Lori *every* time his team plays basketball.
- He sees Brad *only 1 time* – on Day 12.
- He sees both Brad and Lori on Day 12.

Dave doesn't understand the patterns in the schedule.

- a. Lori told Dave the schedule can be explained by thinking about multiplication. For example, the days Lori plays basketball can be found by multiplying by 2. Convince Dave that Lori is right. Use equations and words to show how multiplication can be used to help you figure out if Dave will *always* see Lori when he plays.

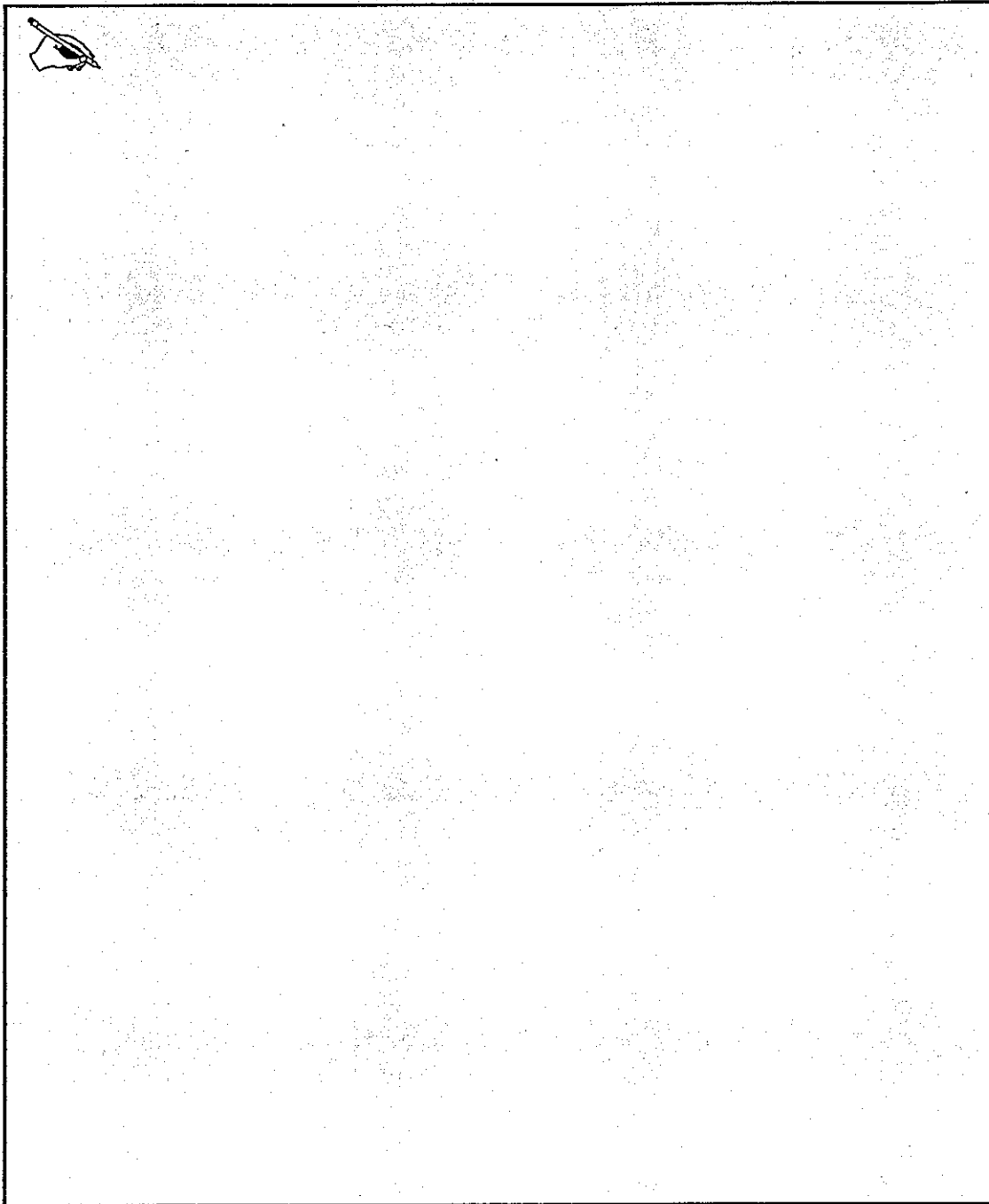
✍️ He will always see Lori when he practices because He plays every 4 days and she plays every 2 days.

Day 1	Day 2 Lori	Day 3	Day 4 Dave Lori	Day 5
Day 6 Lori	Day 7	Day 8 Dave Lori	Day 9	Day 10 Lori

- b. Day 12 is the first time all 3 friends play basketball on the same day. How can each of the students play on the same day when they each play a different schedule? Explain with multiplication or division equations and words why all 3 play together on Day 12.

✍️ Because on day 12 everybody has their

c. Show how your explanation helps predict the next day when all 3 will play on the same day.



REVIEW YOUR
WORK IF YOU
HAVE TIME.

Total Content Points: 0

Total Practice Points: 0

Nowhere in this response does the student provide equations or an acceptable explanation to address the basketball schedule (no credit for 3.0A.3, no credit for MP2). The student does not show any evidence of understanding that the students' schedule represents a pattern of play (no credit for 3.0A.9). Without any attempt to answer Part C, the student shows a lack of perseverance in solving the task (no credit for MP1). For Part A, this response only restates what was asked in the prompt, and thus does not address Lori's claim (no credit for MP3). The student's inability to understand the possible correct approaches to addressing this task shows a lack of understanding of the structure of the problem (no credit for MP7).

Total Awarded Points: 0 out of 6