HOPEFUL

EXTENDING TEACHERS' COMPETENCES IN THE **EFFECTIVE TEACHING**
OF **LITERACY, NUMERACY AND DIGITAL SKILLS** TO REFUGEE CHILDREN

Project Partners

Lower Post Primary

1. Numeracy Competence

The first chapter of this booklet features exercises on the following 3 topics of Numeracy Competence:

1.1. Numbers

1.1.1. Natural and Integer Numbers[1]

1. Which one of the following is a natural number?

 a. - 5
 b. 3/7
 c. 2.112
 d. 1,000,000

2. Is zero a natural number?

 a. Yes
 b. No
 c. It depends on the context
 d. Sometimes

3. The number .64 is an example of a _____.

 a. whole number
 b. decimal
 c. remainder
 d. division problem

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[1] https://www.mathway.com/

https://www.mathcentre.ac.uk/

http://www.math.com/

https://www.math-only-math.com/

4. Put the following in increasing order:

    a. -2, -5, +8, -9, +11
    b. -11, +21, -31, +41, -51
    c. +4, -10, 0, +6, -9
    d. -6, -2, -8, -15, -22
    e. -16, +19, +34, -47, -88
    f. -10, +6, -50, +10, 0

5. Write:

    a. 4 numbers greater than - 5 but less than 0
    b. 5 numbers greater than - 6 but less than 1

6. What are the solutions of the following equations?

    a. $X + 8 = 12$
    b. $Y - 9 = 25$
    c. $X + 15 = 6$
    d. $3 \times Y = 9$

7. Solve the following:

    a. Find two consecutive integers whose sum is equal 129.
    b. The sum of three consecutive even integers is equal to 84. Find the numbers.
    c. The sum of the first and third of three consecutive odd integers is 131 less than three times the second integer. Find the three integers.

8. Factor the following numbers to their prime factors.

    18   6   14
    / \   / \   / \

1.1.2. Operators

1. Solve the following additions and subtractions:

8673 - 1448 =	9759 - 9133 =	3225 - 2649 =	8646 + 9848 =	5574 - 4984 =
8062 - 1538 =	7030 + 8803 =	8105 + 6802 =	3893 + 4439 =	5336 - 2864 =
4598 + 3634 =	6987 - 5802 =	5916 + 1806 =	3204 - 2652 =	2897 + 5307 =

2. Solve the following multiplications and divisions:

84 / 12 =	27 / 3 =	60 / 10 =	34 / 2 =	108 / 18 =
160 / 8 =	323 / 19 =	64 / 8 =	6 x 13 =	8 x 18 =
19 x 18 =	3 x 6 =	14 x 16 =	11 / 11 =	14 x 4 =

3. Solve the following algebraic equation. Choose the correct answer:

(x + 3) / 0 = _____.

    a.   Undefined
    b.   0
    c.   3
    d.   -3

4. What is one reason that a number cannot be divided by zero?

    a.   There is no result
    b.   None of the answers are correct.
    c.   Because it's an odd number.
    d.   Because it's an even number.

5. Evaluate each expression using the rules for order of operations.

6 + 7 x 8

1.1.3. Fractions

1. Convert to decimals:

    a.   6/10 =
    b.   41/100 =
    c.   76/100

2. Compare the fraction without changing to equivalent fractions:

1/2 _____ 7/9

3. a. Order the fractions from smallest to greatest:

3/7 , 3/4 , 2/9 , 8/11 , 7/10

b. Order the fractions from greatest to smallest

7/9 , 2/5 , 1/6 , 6/8, 5/9

4. Solve the following:

Sally ate 2 candy bars and Sam ate 3/4 of a candy bar. How much did they eat together?
   a. 2, 3/4
   b. 2/1
   c. 5/5
   d. 10/4

7+ 12/13
(7.92)

1.2. Algebra

1.2.1. Relationships in Patterns[2]

1. Find the next number in the following sequences:

    a.   3, 6, 18, 72, …?
    b.   1, 9, 17, 33, 49, 73, …?

2. Identify the rule for this numerical sequence:

    15, 20, 25, 30, 35, 40, . ,   , 55,   , 65, 70, 75,   85,

3. Solve the following:

    a.   Given that x satisfies the equation $|2x+3|=|2x–1|$, find the value of $|4x–3|–|6x|$.
    b.   The value of x which satisfies the equation $2x-(4-x)=5-x$ is:

1.2.2. Linear Expressions

1. Simplify the following expressions:

    a. $5(x − 4) = 2(x − 3)$
    b.   -7ab + 6b - 3ab - 4b - 3ab
    c. $4x^3 - 2x^2 + 5x^3 + 2x - 4x^2 - 6x$

1.2.3. Linear Equations

1. Solve the following linear equations:

    a. $10x − 1 = 16 − 6x$
    b. $x/2 + x/3 = 5$
    c. $3 − y + 5y/6 = 1/2 − y/8$
    d. $9x − 8 = 11x - 10$

1. Student Ice cream flavours survey
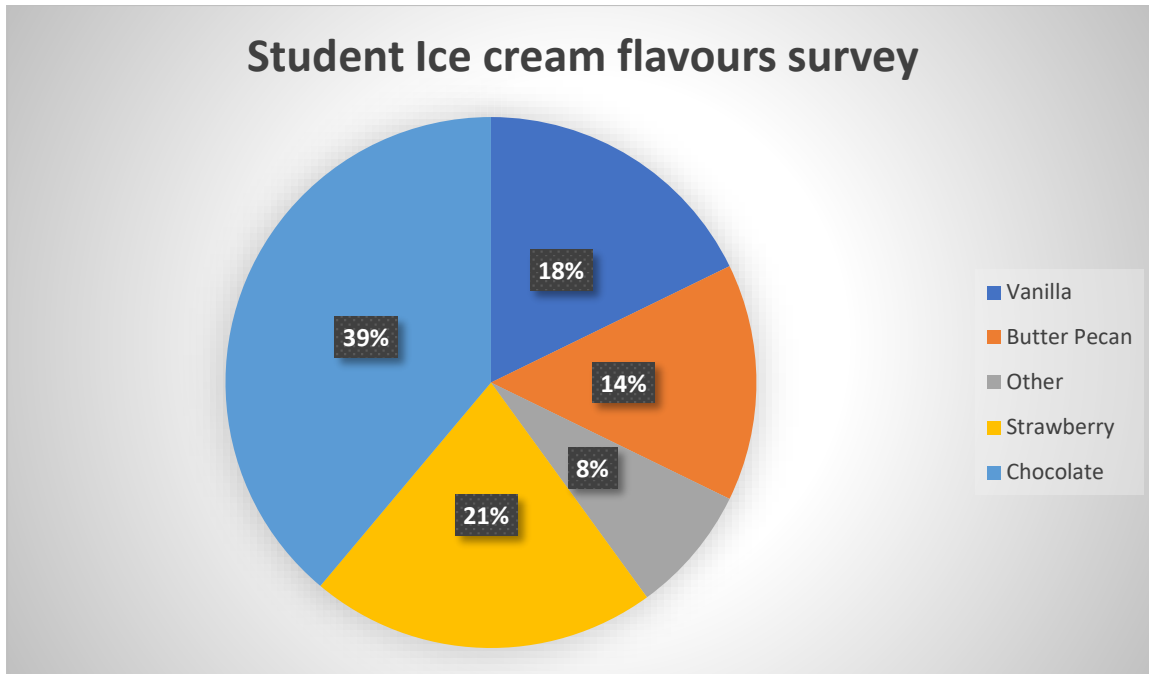
a. How many sectors are in this circle graph?
b. What percentage of students preferred chocolate ice cream?
c. What percentage of students preferred butter pecan ice cream?
d. What percentage of students didn't prefer a particular flavour?
e. If a total of 50 people were surveyed, then how many people preferred vanilla ice cream?
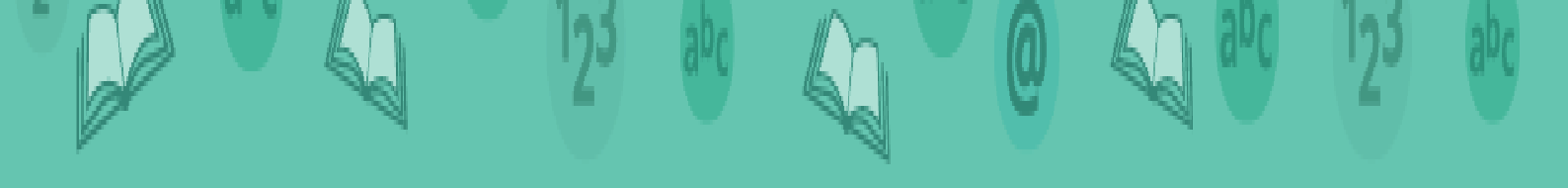
2. Students in a class voted on their favourite fruit. Each student voted once. The bar graph below summarizes the data collected from the class vote.

Number of students
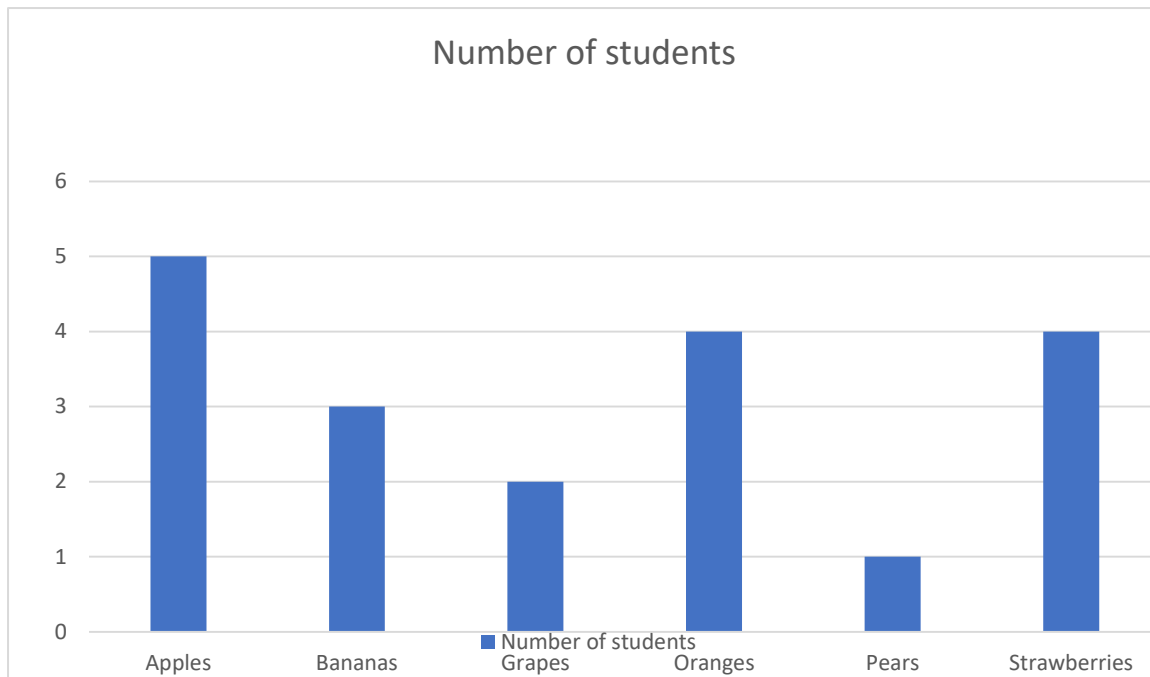
a. What is the range of values on the vertical scale?
b. How many categories are in the graph?
c. Which fruit had the most votes?
d. Which fruit has the least votes?
e. How many students voted for bananas?
f. How many students voted for grapes?
g. Which two fruits had the same number of votes?
h. List the categories of the graph from the least to the greatest.

Upper Post Primary

1. Numeracy Competence

The first chapter of this booklet features exercises on the following 2 topics of Numeracy Competence:

1.1. Algebra

1.1.1. Basic Calculations

1. a. Solve the following equation:

$$5(-3x-2)-(x-3) = -4(4x+5)+13$$

b. Simplify the following equation:

$$2(a-3)+4b-2(a-b-3)+5$$

2. Solve the following:

    a. $0.06x+0.02 = 0.25x-1.5$
    b. $0.65k-0.1 = 0.4k-0.35$

3. Find the LCD of 5/6 and 1/4

1.1.2. Square Numbers, Roots and Powers

1. Solve the following:

    a. $\sqrt{36}$
    b. $\sqrt{256}$
    c. $\sqrt{25}$
    d. $\sqrt{144}$
    e. $\sqrt{94}$
    f. $\sqrt{704}$

2. Find the value of the following powers:

    a.   104
    b.   1010
    c.   1015
    d.   101

1.1.3. Radicals and Surds

1. Simplify the following expressions:

    a. $\sqrt{400} \times \sqrt{90}$
    b. $\sqrt{40} \times \sqrt{200}$ (
    c. $90 \times \sqrt{600000}$
    d. $\sqrt{1000}/\sqrt{40}$
    e. $(1-\sqrt{5})(1+\sqrt{5})$
    f. $(\sqrt{7}+3)(\sqrt{7}-3)$

2. Rationalize the following expressions:

    a.   1 √ 5 − √ 3

    b.   √ 11

    c.   30/ √ 3

    d.   1/(1 − √ 3)

    e.   1/(√ 7 + √ 2)

    f.   2/(√ 5 − √ 7)

1.1.4. Proportionality

1.1.4.1. Direct Proportionality

1. Given the pairs of numbers, answer to the following questions:

X	2	3	6	7	8
Y	14	21	42	49	56

(Source: Esercizi sulle grandezze direttamente proporzionali (impariamoinsieme.com))

    1.1. Which kind of proportionality these pair of numbers represent?

        a.   Inverse

        b.   Direct

    1.2. Which, among the following, represents the right equation?

        a.   y= 7x

        b.   y=9x

        c.   y=5x

        d.   y=4x

2. Given the pairs of numbers, answer to the following questions:

X	3	7	8	10	11
Y	27	63	72	90	99

    2.1. Which kind of proportionality these pair of numbers represent?

        a.   Inverse

        b.   Direct

    2.2. Which, among the following, represents the right equation?

        a.   Y=8x

        b.   Y=7x

        c.   Y=10x

        d.   Y=9x

3. Given the following X values, write the Y in the chart

Y=6x

X	7	2	13	29	4

Y					

1.1.4.2. Inverse Proportionality

4. Given the pairs of numbers, answer to the following questions:

X	2	1	4	6	8
Y	24	48	12	8	6

4.1. Which kind of proportions are these pairs of numbers representing?

    a. Direct
    b. Inverse

4.2. Which, among the following, is the right equation?

    a. $y= 48/x$
    b. $y=28/x$
    c. $y=7/x$
    d. $y=11/x$

5. Given these pairs of numbers, choose the right equation:

X	2	1	8	4	5
Y	60	120	15	30	24

    a. $Y=160/x$
    b. $y=80/x$
    c. $y=120/x$
    d. $y=60/x$

6. Given the following X value, write the Y in the chart

$Y=x/150$

X	1	2	3	5	10	15
Y						

7. Which proportion does the graph below represent?
    a. Direct
    b. Inverse

(Source:internal)

8. Which proportion does the graph below represent?
    a. Direct
    b. Inverse
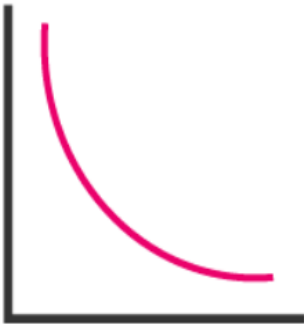
(Source: direct-and-inverse-proportion.png (750×350) (byjus.com)

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1.1.5.1. Functions and Relations

1. Given the graph represented in the image below, answer to the following questions:
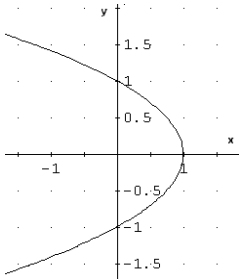
(Source: Questions on Functions with Solutions (analyzemath.com))

1.1. Is the graphs a function?
   a. Yes
   b. No

1.2. Write the correct equation that correspond to the graph:

2. Given the image below, answer the following questions:
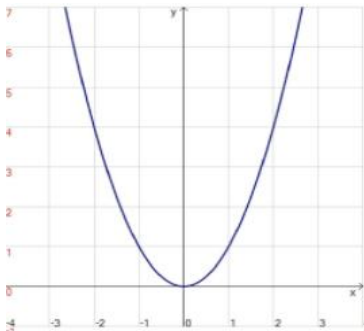
(Source: funzione pari e funzione dispari | mathnotes)

2.1. Is the equation a function?
   a. Yes
   b. No

2.2. Write the correct equation:

3. State whether the following statements are true or false:

3.1. 12 is a constant and z is a variable but 12z is variable.
   a. True
   b. False

3.2. 7 is constant and p is variable but together 7 + p is a variable.
   a. True
   b. False

3.3. 13 is constant and m is variable but together 13 - m is a constant.
   a. True
   b. False

3.4. 11 is constant and n is variable but together 11 n is a constant.
   a. True
   b. False

3.5. 0 is a variable.
   a. True
   b. False

3.6. Combination of both a constant and a variable is also variable.
   a. True
   b. False

3.7. A quantity which takes a fix numerical value is called variable.
   a. True
   b. False

3.8. A quantity or symbol which has a no fixed value but it can represent any numerical values is called variable.
   a. True
   b. False

3.9. 15x, z/3, 7/m are some of the examples of constants.
   a. True
   b. False

3.10. x, a + b, c – 2, a 13 are some of the examples of variables.
   a. True
   b. False

(Source: Worksheet on Constants and Variables | Constants and Variables | Answers (math-only-math.com))

4. Write the Cartesian coordinates of each point shown in the following graph (write the correct answer)

4.1.
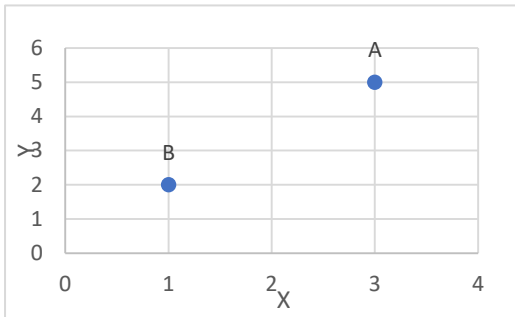
A: (_;_)

B: (_;_)

4.2.
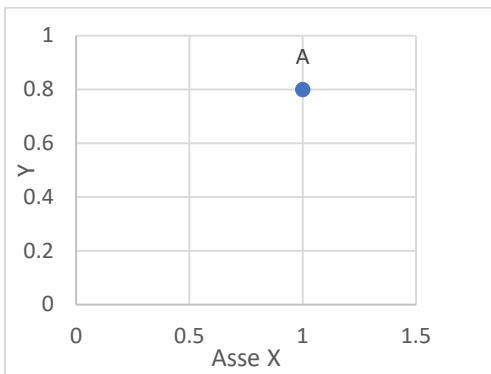
A: (_;_)

(Source: internal)

1. Solve the following systems of simultaneous equations (write the right answer)

    1.1.

        a. **2y+3x=6**

        b. **Y=4x-2**

        x=

        y=

    1.2.

        a. **3x+4y=12**

        b. **2x-3y=8**

        x=

        y=

    1.3.

        a. **3x-2y+3z=-16**

        b. **X+2y-z=6**

        c. **2x-y+3z=-13**

        x=

        y=

        z=

    1.4.

        a. **x+4=15**

        b. **x-2y=12**

        x=

        y=

(Source: BestMaths)

1.1.7. Polynomials

1.1.7.1. Polynomial expressions

1. Which polynomials are in a standard form?
   a. t^4-1
   b. 2t^2+3t+4
   c. 4t-7
   d. None of the above

2. Which of the following expressions is not a polynomial?
   a. X^3-4x^2+5$\sqrt{x}$+1
   b. X^3-5x^2 +2
   c. X^2+4
   d. X

(Source: Polynomials intro (practice) | Khan Academy)

3. Write the degree of each of the following polynomial expressions in the following table:

a. $5x^4+11x^3+2x$ +1	
b. $\sqrt{5}x^2+\frac{1}{6}x^3-\frac{1}{5}x+7$	
c. $x^9+\frac{3}{7}x^7+6x$	
d. 5y+8	
e. 3	

(Source: Polynomial Expressions | Basics & Definition | Solved Examples - Cuemath)

1.1.7.2. Quadratic expressions

4. Factorize the quadratic expressions and write the results:
   a. x^2+4x+3=
   b. x^2-7x+12=
   c. x^2-2x-8=
   d. x^2+x-2=
   e. 6x^2-7x-20=
   f. 12x^2-x-6=
   g. x^2-25=
   h. x^2-6x+9=
   i. x^2+2ax+a^2=
   j. 4x2-4x+1=

(Source: 07-QuadraticEquations.pdf (une.edu.au))

1.2. Statistics and Probability

1.2.1. Data Collection

1.2.1.1. Level of Measurement: Nominal, Ordinal, Interval or Ratio

1. Write the right option choosing among: Nominal, Ordinal, Interval or Ratio.
   a. High school men soccer players classified by their athletic ability: Superior, Average, Above average.
   b. Baking temperatures for various main dishes: 350, 400, 325, 250, 300
   c. The colours of crayons in a 24-crayon box.
   d. Social security numbers.
   e. Incomes measured in dollars
   f. A satisfaction survey of a social website by number: 1 very satisfied, 2 somewhat satisfied, 3 not satisfied.
   g. Political outlook: extreme left, left-of-center, right-of-center, extreme right.
   h. Time of day on an analog watch.
   i. The distance in miles to the closest grocery store.
   j. The dates 1066, 1492, 1644, 1947, 1944.
   k. The heights of 21 65 year-old women.
   l. Common letter grades A, B, C, D, F.

(Source: Solved: What type of measure scale is being used? Nominal, ordi... | Chegg.com)

2. Given the following data, answer the questions:

Day	Celsius	Fahrenheit
1	6	42.8
2	9	48.2
3	15	59

2.1. The data collection is measurable by nominal or ordinal scale?
   a. Nominal
   b. Ordinal

2.2. The data collection is an interval or report scale?
   a. Interval
   b. Report scale

1.2.1.2. Organize Data: Absolute, Relative and Cumulative Frequencies, Frequency Table

3. Given the following data collection:

5	6	3	4	7
2	0	3	3	4

5	1	3	4	3

3.1. Complete the frequency table:

Number	Frequency
a. 0	
b. 1	
c. 2	
d. 3	
e. 4	
f. 5	
g. 6	
h. 7	
i. Total	

3.2. Calculate the relative frequency of 0 (write the correct answer):

3.3. Calculate the relative cumulative frequency of 1 (write the correct answer):

1.2.2. Data Set Characteristics

1.2.2.1. Mode, Mean, Median, Quartiles, Measure of Center, Measure of Spread

1. Given the following data set:

Player	Height
Player 1	1,96
Player2	1,97
Player 3	1,98
Player 4	2,01
Player 5	2,01

1.1. Calculate the median (write the correct answer):

1.2. Calculate the mode (write the correct answer):

1.3. Calculate the quartiles (write the correct answer):

2. Given the data set 1,1,2,3,5,81,1,2,3,5,8 – answer the following questions:

2.1. What is the range?

2.2. What is the variance?

(Source: Exercises - Measures of Center and Spread (emory.edu))

1.2.3. Graphical Representation of Data

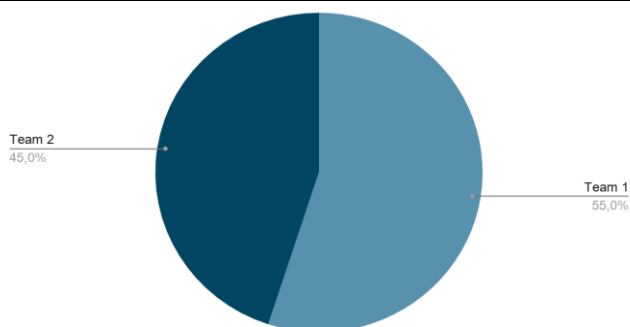### 1.2.3.1. Graphical Representations, Pie Chart, Bar Chart, Comparing Two Sets of Data

1. Given the data set and the pie chart below, answer to the following questions:

Team basket 1

Player	Height
1	1,96
2	1,97
3	1,98
4	2,01
5	2,01

Team basket 2

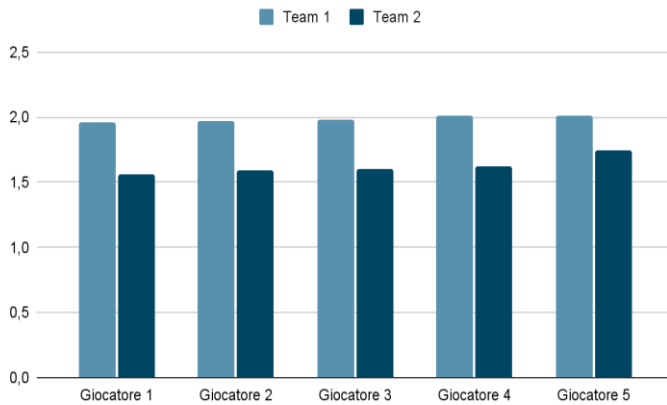| Player	Height
1	1,56
2	1,59
3	1,60
4	1,62
5	1,75

Team 2
45,0%

Team 1
55,0%

(Source: internal)

1.1. Which is the tallest team? (Write the correct answer)

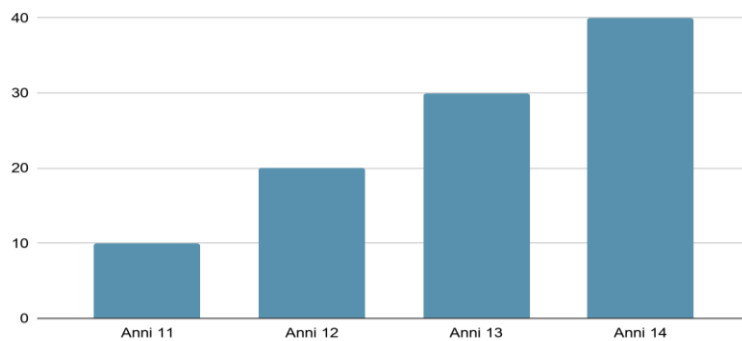**2.Given the bar chart below, answer the following question:**

(Source: Internal)

2.1. Which player of each team is the tallest?

Team 1:

Team 2:

3.The following bar chart is a representation of the age of the students in a specific school. Answer the following question:

(Source: internal)

3.1. How many students does the school have?

a. 100
b. 110
c. 90
d. 12

1.2.4. Probability

1.2.4.1. Sample Space

1. What is the sample space for choosing an odd number from 1 to 11 at random?
    a.   1,2,3,4,5,6,7,8,9,10,11
    b.   {1,2,3,4,5,6,7,8,9,10,11}
    c.   1,3,4,7,9,11}
    d.   None of the above

2. What is the sample space for choosing a prime number less than 15 at random?
    a.   {2,3,5,7,11,13,15
    b.   {2,3,5,7,11,13}
    c.   {2,3,5,7,9,11,13}
    d.   All of the above

3. What is the sample space for choosing 1 jelly bean at random from a jar containing 5 red, 7 blue and 2 green jelly beans?
    a.   5 red, 7 blue, 2 green
    b.   Red, blue, green
    c.   None of the above

4. What is the sample space for choosing 1 letter at random from 5 vowels?
    a.   {a, e, I, o, u}
    b.   {v, o, w, e, l}
    c.   {1, 2, 3, 4, 5}
    d.   None of the above

(Source: Sample Spaces | Math Goodies)

1.2.4.2. Concept of Complementary, Independent, Mutually Exclusive and Exhaustive Events

5. What are mutually exclusive events?
    a.   Events that add up at 100% Events that can happen at the same time
    b.   Events that cannot happen at the same time

6. Tossing a coin and landing on head and tails
    a.   Mutually exclusive
    b.   Not mutually exclusive

7. Rolling a 6 or an even number
    a.   Mutually exclusive
    b.   Not mutually exclusive

8. Drawing a red or an ace from a deck of cards
    a.   Mutually exclusive
    b.   Not mutually exclusive

(Source: Mutually exclusive and complementary events (Only) - Quizizz)

9. Write the correct answer to the following questions:

9.1. There are 26 tiles of which 5 represent vowels in a game of scrabble. Two tiles are drawn so that the first is replaced before the second is drawn. What is the probability of not getting a consonant both the times?

9.2. A selection of balls numbered 1 to 10 is in a bucket. What is the complement to select a ball having number multiple of 3?

9.3. Drawing a king and drawing a spade from a standard deck of cards. Are these events mutually exclusive? (Type yes or no)

9.4. A spinner has the six letters F, I, G, U, R and E written on each of its six equal segments. Tom tosses a coin and spins the spinner. Are these two events dependent or independent?

9.5. There are 3 pens and 5 pencils in a box. If a student selects two of them at random, what is the probability of selecting a pencil and then a pen?

(Source: [Math Worksheets Center - Worksheet Viewer Page](#))

1.2.4.3. Venn Diagram

10. Out of forty students, 14 are taking English Composition and 29 are taking Chemistry. Answer the following questions:

10.1. If five students are in both classes, how many students are in neither class?

a. 2
b. 1
c. 3

10.2. How many are in either class?

a. 40
b. 41
c. 38

10.3. What is the probability that a randomly-chosen student from this group is taking only the Chemistry class?

a. 70%
b. 60%
c. 65%

(Source: [Venn Diagrams: Exercises | Purplemath](#))