






Goal difference — the importance of zero

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Assessment description	Category
Students will interpret data containing positive and negative numbers in sporting league tables.	Written
	Technique
	Mathematical investigation
Context for assessment	Alignment
Negative numbers are used in everyday situations. They are sometimes used to compare the progress of sporting teams through competitions. Students use tables that include positive and negative numbers to make judgments about how the teams are progressing.	<ul style="list-style-type: none"> <i>Australian Curriculum v5.1</i>, Year 6 Mathematics Australian Curriculum content and achievement standard, ACARA — Australian Curriculum, Assessment and Reporting Authority, www.australiancurriculum.edu.au <i>Year 6 standard elaborations — Australian Curriculum: Mathematics</i>, www.qsa.qld.edu.au/yr6-maths-resources.html
	Connections
	This assessment can be used with the QSA Australian Curriculum resource titled <i>Year 6 unit overview – Mathematics exemplar</i> (The importance of zero), available at: www.qsa.qld.edu.au/13647.html#16458 Year 6 Mathematics resources www.qsa.qld.edu.au/yr6-maths-resources.html
	Definitions
	Refer to the Australian Curriculum definitions at www.australiancurriculum.edu.au and the Year 6 Mathematics standards elaborations glossary at www.qsa.qld.edu.au/yr6-maths-resources.html
In this assessment	
Teacher guidelines	
Student booklet	
Model response	
Task-specific standards — continua	
Task-specific standards — matrix	

Teacher guidelines

Identify curriculum

Content descriptions to be taught	
Number and Algebra	Statistics and Probability
Number and place value <ul style="list-style-type: none"> Investigate everyday situations that use integers. Locate and represent these numbers on a number line (ACMNA124) Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers (ACMNA123) 	Data representation and interpretation <ul style="list-style-type: none"> Interpret secondary data presented in digital media and elsewhere (ACMSP148)
General capabilities (GCs) This assessment may provide opportunities to engage with the following GCs. Refer also to the Resources tab on the Mathematics curriculum hub: www.qsa.qld.edu.au/yr6-maths-resources.html	
<ul style="list-style-type: none">  Literacy  Numeracy  ICT capability  Critical and creative thinking  Personal and social capability 	
Achievement standard This assessment provides opportunities for students to demonstrate the following highlighted aspects.	
<p>By the end of Year 6, students recognise the properties of prime, composite, square and triangular numbers. They describe the use of integers in everyday contexts. They solve problems involving all four operations with whole numbers. Students connect fractions, decimals and percentages as different representations of the same number. They solve problems involving the addition and subtraction of related fractions. Students make connections between the powers of 10 and the multiplication and division of decimals. They describe rules used in sequences involving whole numbers, fractions and decimals. Students connect decimal representations to the metric system and choose appropriate units of measurement to perform a calculation. They make connections between capacity and volume. They solve problems involving length and area. They interpret timetables. Students describe combinations of transformations. They solve problems using the properties of angles. Students compare observed and expected frequencies. They interpret and compare a variety of data displays including those displays for two categorical variables. They evaluate secondary data displayed in the media.</p> <p>Students locate fractions and integers on a number line. They calculate a simple fraction of a quantity. They add, subtract and multiply decimals and divide decimals where the result is rational. Students calculate common percentage discounts on sale items. They write correct number sentences using brackets and order of operations. Students locate an ordered pair in any one of the four quadrants on the Cartesian plane. They construct simple prisms and pyramids. Students list and communicate probabilities using simple fractions, decimals and percentages.</p>	
Source: ACARA, The Australian Curriculum v5.1, www.australiancurriculum.edu.au/mathematics/Curriculum/F-10?y=6&s=NA&s=MG&s=SP&layout=1	

Sequence learning

Suggested learning experiences

This assessment leads on from the learning experiences outlined in the QSA's Year 6 Mathematics unit overview. The knowledge, understanding and skills developed in the exemplar unit will prepare children to engage in this assessment.

See Year 6 unit overview — *Mathematics exemplar (The importance of zero)*, available at: www.qsa.qld.edu.au/yr6-maths-resources.html.

Adjustments for needs of learners

To make adjustments, teachers refer to learning area content aligned to the student's chronological age, personalise learning by emphasising alternate levels of content, general capabilities or cross-curriculum priorities in relation to the chronological age learning area content. The emphasis placed on each area is informed by the student's current level of learning and their strengths, goals and interests. Advice on the process of curriculum adjustment for all students and in particular for those with disability, gifted and talented or for whom English is an additional language or dialect are addressed in *Australian Curriculum — Student Diversity* materials.

For information to support students with diverse learning needs, see:

- Queensland Studies Authority materials for supporting students with diverse learning needs www.qsa.qld.edu.au/10188.html
- Australian Curriculum Student Diversity www.australiancurriculum.edu.au/StudentDiversity/Overview
- The *Melbourne Declaration on Educational Goals for Young Australians* www.mceecdya.edu.au/mceecdya/melbourne_declaration,25979.html
- *Disability Standards for Education* www.ag.gov.au/RightsAndProtections/HumanRights/DisabilityStandards/Pages/Disabilitystandard sfeducation.aspx.

Resources

Online

- Mathematics and numeracy learning objects for the Australian Curriculum. National digital learning resources network, e.g. *Integer cruncher series* under Secondary> Number and Algebra, www.ndlrm.edu.au/using_the_resources/australian_curriculum_resources/mathematics.html
- Negative number activities. BBC Skillswise, *Negative numbers*, www.bbc.co.uk/skillswise/topic/negative-numbers
- Negative number game. Cyberchase, *Space coupe to the rescue*, <http://pbskids.org/cyberchase/games/negativenumbers>
- Strategies for teaching numbers. Queensland Studies Authority, Mathematics (2004) support materials, *About number* under Information for teachers, www.qsa.qld.edu.au/1184.html

Objects

- Pencil and eraser
- Calculators
- Notepaper and number lines for working

Develop assessment

Preparing for the assessment

- Investigate integer sequences involving both positive and negative numbers and extend them upwards and downwards.
- Experiment with the application of negative numbers. For example:
 - Place a giant number line on the floor or ground. Ask small groups to move forward and backwards from zero. Increase the complexity as understanding develops.
 - Develop fluency by playing a simple dice game: Player A adds their result on a number line, Player B subtracts. Track progress above and below zero.
- Use vertical and horizontal number lines as representations of negative and positive numbers. For example:
 - Solve problems about a building elevator to determine its position on a number line, such as: A building has 10 storeys above ground where the ground floor is zero. It also has 6 storeys below ground for parking. If I am on Floor 2 and I ride the elevator down 4 floors, which floor will I be on?
 - Leave a thermometer in the freezer until it shows below zero, then track its progress as it warms up from below to above zero.
 - Score games or competitions between two teams on a ‘point difference’ number line, with one team’s score adding and the other team’s subtracting.
- Create tables to represent data sets and as a tool for data analysis and problem solving.
- Develop and use mathematical vocabulary to explain and compare strategies.
- Develop explanations and arguments that are based on multiple pieces of data or evidence, e.g. ‘If ... then ... because ... as well as ...’
- Use spreadsheets to create tables and to graph positive and negative data onto a line graph. For example:
 - Make graphs depicting positive and negative temperatures.
 - Use a line graph to track a sporting team’s goal difference across a season, or the relative scores over time within a game.

Implementing

Section 1. League tables

Focus question: *What does a league table show?*

Student role

- In a class discussion, compare league tables for a range of sports and discuss the similarities and differences in the data they present.
- Focus on Table 1 in the Student booklet (or other selected table) and explore how information about teams’ progress in the competition is presented.
- In groups, check that each team’s goal difference result has been calculated correctly.
- One student from each group reports back to the whole class on the accuracy of the goal difference results for the teams checked. They verbally explain the method they used to check the results.
- Write examples that explain the importance of zero.

Teacher role

- Refer to the fictional example of a sporting competition included in the *Student booklet* or modify to use current data from a local competition or data that the students collect themselves throughout a season. Any sporting competition that has points scored for and against will be suitable for finding the goals and points difference.
- Facilitate discussion of the discussion questions provided in Section 1.
- Assist individuals in using calculators to explore options.
- Facilitate the reporting session and discussion to identify the range of strategies used to find the goal difference.
- Provide literacy support where necessary to enable students to demonstrate their mathematical knowledge and skills.

Section 2. Investigating a competition

Focus question: *How are the teams performing so far?*

Student role

- As a class, read Table 2: Interschool soccer competition results, and discuss what the table is showing.
- Work individually to complete Table 3.

Teacher role

- Facilitate discussion on the draw for the interschool sporting competition in the Student booklet, or your own resource.
- Ensure all students can read the table accurately.
- Discuss the sample calculation: *Home and away results for All Saints*, to ensure students understand the process demonstrated.
- Distribute notepaper or extra number lines for students to use to work out the totals.
- Assist students who need literacy support.

Section 3. Interpreting data

Focus question: *How does the table help us to compare teams?*

Student role

- Working individually, analyse the data collected in Table 3 to explain team performance and predict future results.
- In Q6, students complete a table which has headings provided to suggest a mode of analysis.
- In Q7, students make their own choice about how to use the table.

Teacher role

- Encourage students to document their analysis and to use data to justify their solutions. There is no preferred strategy or answer to these questions. It is students' reasoning and logical use of data that are being valued.
- Provide literacy support where necessary to enable students to demonstrate their mathematical knowledge and skills. There are significant literacy demands in this section of the assessment.

Make judgments

When making judgments about the evidence in student responses to this assessment, teachers are advised to use the task-specific standards provided. The development of these task-specific standards has been informed by the Queensland Year 6 standard elaborations.

See www.qsa.qld.edu.au/yr6-maths-resources.html.

The Queensland standard elaborations for Mathematics

The Queensland Year 6 standard elaborations for Mathematics is a resource to assist teachers to make consistent and comparable evidence-based A to E (or equivalent) judgments. It should be used in conjunction with the Australian Curriculum achievement standard and content descriptions for the relevant year level.

The Queensland Mathematics standard elaborations provide a basis for judging *how well* students have demonstrated what they know, understand and can do using the Australian Curriculum achievement standard.

The Australian Curriculum achievement standards dimensions of Understanding and Skills are used to organise the Queensland Mathematics standard elaborations. Understanding and Skills in Mathematics are organised as Understanding & Fluency and Problem solving & Reasoning.

The valued features of Mathematics drawn from the achievement standard and the content descriptions for Mathematics are organised as:

- Number and place value
- Data representation and interpretation.

Task-specific standards

Task-specific standards give teachers:

- a tool for directly matching the evidence of learning in the student response to the standards
- a focal point for discussing student responses
- a tool to help provide feedback to students.

Task-specific standards are not a checklist; rather they are a guide that:

- highlights the valued features that are being targeted in the assessment and the qualities that will inform the overall judgment
- specifies particular *targeted aspects* of the curriculum content and achievement standard
- aligns the valued feature, task-specific descriptor and assessment
- allows teachers to make consistent and comparable on-balance judgments about student work by matching the qualities of student responses with the descriptors
- clarifies the curriculum expectations for learning at each of the five grades (A–E or the early years equivalent)
- shows the connections between what students are expected to know and do, and how their responses will be judged and the qualities that will inform the overall judgment
- supports evidence-based discussions to help students gain a better understanding of how they can critique their own responses and achievements, and identify the qualities needed to improve
- encourages and provides the basis for conversations among teachers, students and parents/carers about the quality of student work and curriculum expectations and related standards.

Task-specific valued features

Task-specific valued features are the discrete aspects of the valued features of Mathematics targeted in a particular assessment and incorporated into the task-specific standards for that assessment. They are selected from the Queensland Mathematics standard elaborations valued features drawn from the Australian Curriculum achievement standard and content descriptions.

Task-specific valued features for this assessment

The following table identifies the valued features for this assessment and makes explicit the understandings and skills that students will have the opportunity to demonstrate. This ensures that the alignment between what is taught, what is assessed and what is reported is clear.

Australian Curriculum Year 6 Mathematics	Goal difference — the importance of zero	Teacher guidelines
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Australian Curriculum achievement standard dimensions	Australian Curriculum Proficiency strands	Queensland standard elaborations valued features	Task-specific valued features
Understanding and Skills	Understanding & Fluency	<ul style="list-style-type: none"> Conceptual understanding Procedural fluency 	<ul style="list-style-type: none"> Description of the role of zero. Location and representation of zero and positive and negative numbers on a number line (Q1 & 3) Addition and subtraction of positive and negative numbers (Q2 & 6a)
	Problem solving & Reasoning	<ul style="list-style-type: none"> Problem solving approaches Reasoning and justification 	<ul style="list-style-type: none"> Application of problem solving approaches to analyse positive and negative data in sporting tables (Q7a) Explanations of mathematical thinking to justify conclusions (Q4, 5, 6b, 7b & 8)

The task-specific standards for this assessment are provided in two models using the same task-specific valued features:

- a matrix
- a continua.

Matrix and Continua

Task-specific standards can be prepared as a matrix or continua. Both the continua and the matrix:

- use the Queensland standard elaborations to develop task-specific descriptors to convey expected qualities in student work — A to E or equivalent
- highlight the same valued features from the Queensland standard elaborations that are being targeted in the assessment and the qualities that will inform the overall judgment
- incorporate the same task-specific valued features i.e. make explicit the particular understanding / skills students have the opportunity to demonstrate for each selected valued feature
- provide a tool for directly matching the evidence of learning in the student response to the standards to make an on-balance judgment about student achievement
- assist teachers to make consistent and comparable evidence-based A to E or equivalent judgments.

Continua

The continua model of task-specific standards uses the dimensions of the Australian Curriculum achievement standard to organise task-specific valued features and standards as a number of reference points represented progressively along an A–E continuum. The task-specific valued features at each point are described holistically. The task-specific descriptors of the standard use the relevant degrees of quality described in the Queensland standard elaborations.

Teachers determine a position along each continuum that best matches the evidence in the students' responses to make an on-balance judgment about student achievement on the task.

The continua model is a tool for making an overall on-balance judgment about the assessment and for providing feedback on task specific valued features.

Matrix

The matrix model of task-specific standards uses the structure of the Queensland standard elaborations to organise the task-specific valued features and standards A to E. The task-specific descriptors of the standard described in the matrix model use the same degrees of quality described in the Queensland standard elaborations.

Teachers make a judgment about the task-specific descriptor in the A to E (or equivalent) cell of the matrix that best matches the evidence in the students' responses in order to make an on-balance judgment about how well the pattern of evidence meets the standard.

The matrix is a tool for making both overall on-balance judgments and analytic judgments about the assessment. Achievement in each valued feature of the Queensland standard elaboration targeted in the assessment can be recorded and feedback can be provided on the task-specific valued features.

Use feedback

Feedback to students	<p>Evaluate the information gathered from the assessment to inform teaching and learning strategies. Focus feedback on the student's personal progress and the next steps in the learning journey.</p> <p>Offer feedback that discusses:</p> <ul style="list-style-type: none">• the importance of following the procedures outlined in the student booklet explicitly and in order• how their interpretation of results in Section 3 could contribute to well-reasoned conclusions• how communication of conclusions could be more effective with clear mathematical language and representations. <p>The task-specific standards for this assessment can be used as a basis for providing feedback to students.</p>
Resources	<p>For guidance on providing feedback, see the professional development packages titled:</p> <ul style="list-style-type: none">• <i>About feedback</i> www.qsa.qld.edu.au/downloads/p_10/as_feedback_about.doc• <i>Seeking and providing feedback</i> www.qsa.qld.edu.au/downloads/p_10/as_feedback_provide.doc

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Numbers above and below zero can be used to compare the progress of sporting teams in competitions.

You will:

- analyse data in league tables
- use data to judge how teams are performing and to predict future results.

Section 1. League tables

Focus question: How are the teams performing so far?



As a class, explore how a table is used to show how teams progress in a competition.

Look at a results table for a team sport. An example can be found on the English Premier League website, www.premierleague.com/page/LeagueTables.

The table will look something like this.

Table 1: League table example

		Home						Away							
Pos	Name	P	W	D	L	F	A	W	D	L	F	A	GD	PTS	
1	Manchester Utd	7	4	0	0	16	3	2	1	0	8	2	+19	19	
2	Manchester City	7	3	0	0	9	0	3	1	0	14	5	+18	19	
3	Chelsea	7	3	0	0	9	3	2	1	1	8	5	+9	16	
4	Newcastle	7	2	1	0	5	2	2	2	0	4	2	+5	15	
5	Liverpool	7	2	1	0	6	3	2	0	2	4	5	+2	13	
6	Tottenham	6	2	0	1	7	6	2	0	1	4	4	+1	12	
7	Norwich City	7	2	2	0	6	2	0	3	0	3	3	+4	11	
8	Stoke City	7	1	2	0	2	1	1	1	2	2	7	-4	9	
9	Aston Villa	7	1	1	1	3	3	1	1	2	4	7	-3	8	
10	Swansea City	7	2	2	0	5	0	0	0	3	1	9	-3	8	
11	QPR	7	0	2	1	1	5	2	0	2	4	8	-8	8	
12	Fulham	7	1	3	0	9	3	0	1	2	1	4	+3	7	
13	Everton	6	1	1	2	5	6	1	0	1	1	2	-2	7	
14	Wolves	7	1	0	3	3	7	1	1	1	3	3	-4	7	
15	Arsenal	7	2	0	1	4	2	0	1	3	6	14	-6	7	
16	Sunderland	7	1	1	2	7	5	0	2	1	2	3	+1	6	
17	WBA	7	0	1	2	1	3	1	1	2	4	7	-5	5	
18	Wigan Athletic	7	1	1	1	4	3	0	1	3	1	8	-6	5	
19	Blackburn	7	1	0	3	5	10	0	1	2	3	7	-9	4	
20	Bolton	7	0	0	4	4	15	1	0	2	5	6	-12	3	



Discuss these questions with your classmates.

- What is the table showing?
- What do the letters stand for at the top of each column?
- What do the terms 'Home' and 'Away' mean?

Look at the **goal difference** (GD) column.

- What is 'goal difference'?
- How is goal difference calculated?
- Use your calculator to test different ideas about how goal difference is calculated.
- Why are there negative numbers in the goal difference column?



Work in a group to check the goal difference results for a number of teams.

Think about a method you could use to check that a team's goal difference has been calculated correctly. Use calculators to check your method.

Report back to the class on:

- the method you used to check your team's goal difference
- the accuracy of the results with the method that you used.



Work individually to answer Question 1.

Think about the uses we have for 'zero'.

1. Complete the speech bubble below, giving reasons why you disagree with the person on the left.

'Zero' represents nothing, so I think you can ignore it.



I don't agree! There are *lots* of reasons that zero is important. First of all, ...

Section 2. Investigating a competition

Focus question: How are the teams performing so far?

Table 2 shows the draw and results for the first four games of an interschool soccer competition. The Home team is listed first and in **bold**.



As a class, discuss what the table is showing about how the teams have performed.

Table 2: Interschool soccer competition results

Week 1		Week 2		Week 3		Week 4	
All Saints vs Byfield	4 1	All Saints vs Cresthill	5 3	Dalby vs All Saints	0 5	Dalby vs Highfields	1 2
Cresthill vs Dalby	3 0	Byfield vs Dalby	2 0	Byfield vs Eastside	1 4	Eastside vs All Saints	3 4
Eastside vs Forestvale	3 1	Green Valley vs Eastside	0 2	Cresthill vs Highfields	2 2	Green Valley vs Byfield	0 3
Highfields vs Green Valley	0 6	Highfields vs Forestvale	0 1	Forestvale vs Green Valley	2 3	Forestvale vs Cresthill	1 1

The data in Table 2 can be used to calculate each team's points **for** and points **against** for their **home** games and their **away** games.

The calculations for one team have been completed for you below.

Sample calculation: Home and away results for All Saints

All Saints *home* game points *for*: $4 + 5 = 9$

All Saints *home* game points *against*: $1 + 3 = 4$

All Saints *away* game points *for*: $5 + 4 = 9$

All Saints *away* game points *against*: $0 + 3 = 3$



Work individually to complete Questions 2 and 3.

Table 3 analyses goals scored in the game. Some calculations have been done for you. You may need notepaper and a number line to work out the missing data.

2. Complete Table 3. For each team:

- a. calculate **for** and **against** points for **home** and **away** games (look at the sample calculation on the previous page to help you)
- b. calculate the **total goal difference** at the end of Week 4 by:
 - adding the total number of goals scored *for*
 - then subtracting the total number of goals scored *against*.

Hint: Some teams will have a goal difference that is a negative number.

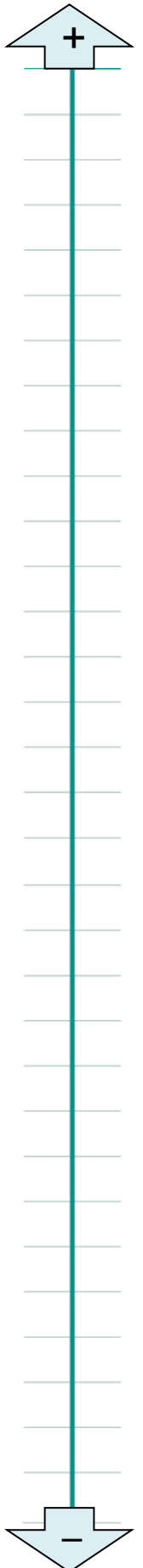
Table 3: Interschool soccer competition goal analysis

School	Home games		Away games		Total goal difference
	for	against	for	against	
All Saints	9	4	9	3	11
Byfield			4	4	
Cresthill	5	2			
Dalby			0	5	
Eastside	6	5			
Forestvale			2	3	
Green Valley	0	5			
Highfields			4	3	

On the number line at the right, each line represents 1.

3. Complete the number line by following the steps below.

- a. Decide on the best place to put zero, and write it on the left side of the number line.
- b. Write numerals to show where each school's goal difference fits on the line.
- c. Add a letter (**A** to **H**) next to the number that represents each school's goal difference on the right side of the number line.



Section 3. Interpreting data

Focus question: How does the table help us to compare teams?



Work individually to complete Section 3.

You can use the data in Table 3 to make judgments about how the teams are performing.

Analyse the data to see which teams have the best **attack** and **defence**, considering:

- a good **attacking** team usually scores a lot of goals
- a good **defending** team has very few goals scored against them.

4. Who is the strongest **attacking** team?

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Explain the evidence that supports your opinion. Show any calculations you used.

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5. Who is the strongest **defending** team?

.....

Explain the evidence that supports your opinion. Show any calculations you used.

.....

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6. Think about whether there is an advantage in playing games at **home** in this competition.
- a. Complete Table 4 below to analyse the data.

Table 4: Home and away results

School	Wins at home	Wins away	Difference (+ or -)
All Saints			
Byfield			
Cresthill			
Dalby			
Eastside			
Forestvale			
Green Valley			
Highfields			
Total			

- b. Use your data to explain whether it was an **advantage** to play at home.

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.....

Another way to analyse the data is to find out which teams are improving as the season progresses.

Think about how the data could help you to judge whether a team is performing better now than at the beginning of the season.

- 7. Which team has **improved** the most throughout the competition?
 - a. Use Table 5 to help analyse the data. Decide what headings and columns you will use.

Table 5: Most improved teams

School	
All Saints	
Byfield	
Cresthill	
Dalby	
Eastside	
Forestvale	
Green Valley	
Highfields	

- b. Use your data to explain which team has **improved** the most.

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Data can't predict the future, but it can help us to judge the most likely outcome.

8. Analyse the data to **predict** who is most likely to win the games in Week 5.

For each prediction, use your data to explain why you have chosen that team.

Table 6: Predictions

Week 5	Prediction <i>Who is most likely to win?</i>	Evidence <i>How does your data support your prediction? Explain why.</i>
All Saints vs Forestvale		
Byfield vs Highfields		
Cresthill vs Green Valley		
Dalby vs Eastside		

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Purpose of assessment: To analyse and interpret data containing positive and negative numbers in sporting league tables.

Understanding and Skills		
Understanding & Fluency	Problem solving & Reasoning	
Description of the role of zero. Location and representation of zero and positive and negative numbers on a number line. (Q1 & 3) Recall and use of facts and procedures to add and subtract positive and negative numbers. (Q2 & 6a)	Application of problem solving approaches to analyse positive and negative data in sporting tables. (Q7a) Explanations of mathematical thinking to justify conclusions. (Q4, 5, 6b, 7b & 8)	
<ul style="list-style-type: none"> ◀ Use of procedures to accurately compile data in tables and add and subtract positive and negative numbers to correctly calculate total goal differences and home and away results. Accurate representation of team results in tables and ranking on a number line. ◀ Connection and description of the role of zero in different situations with some examples. ◀ Use of procedures to accurately compile data in tables. Recognition of the role of zero in simple familiar situations. Accurate location and representation of positive and negative numbers on a number line. ◀ Some use of procedures to compile data in tables. ◀ Statements about the role of zero. 	<ul style="list-style-type: none"> ◀ Systematic application of problem solving approaches to effectively analyse data. Clear explanations of mathematical thinking and reasoning, including justification of choices and conclusions; and making logical predictions about which teams will win the games in Week 5. ◀ Explanation of mathematical thinking and reasoning, including reasons for choices and discussion of conclusions. ◀ Application of problem solving approaches to analyse data. Description of mathematical thinking and discussion of conclusions. ◀ Some application of problem solving approaches to analyse data and statements about choices and conclusions. ◀ Isolated statements. 	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">A</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">B</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">C</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">D</div> <div style="border: 1px solid black; padding: 5px;">E</div>

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Purpose of assessment: To analyse and interpret data containing positive and negative numbers in sporting league tables.

		A	B	C	D	E	
Understanding and Skills	Understanding & Fluency	Conceptual understanding Description of the role of zero. Location and representation of zero and positive and negative numbers on a number line. (Q1 and 3)	Connection and clear description of the role of zero in a range of situations using relevant supporting examples. Accurate representation of team results in tables and ranking on a number line.	Connection and description of the role of zero in different situations with some examples. Representation of team results in tables and ranking on a number line.	Recognition of the role of zero in simple familiar situations. Accurate location and representation of positive and negative numbers on a number line.	Some identification of the role of zero. Representation of zero appropriately on a number line.	Statement about an obvious role of zero.
		Procedural fluency Recall and use of facts and procedures to add and subtract positive and negative numbers. (Q2 and 6a)	Use of procedures to accurately compile data in tables and add and subtract positive and negative numbers to correctly calculate total goal differences and home and away results.	Use of procedures to accurately compile data in tables and add and subtract positive and negative numbers.	Use of procedures to accurately compile data in tables.	Some use of procedures to compile data in tables.	Partial identification of goals scored or wins and losses.
	Problem solving & Reasoning	Problem solving approaches Application of problem solving approaches to analyse positive and negative data in sporting tables. (Q7a)	Systematic application of problem solving approaches to effectively analyse data.	Application of problem solving approaches to accurately analyse data.	Application of problem solving approaches to analyse data.	Some application of problem solving approaches to analyse data.	Partial selection of problem solving approaches.
		Reasoning and justification Explanations of mathematical thinking to justify conclusions. (Q4, 5, 6b, 7b and 8)	Clear explanations of mathematical thinking and reasoning, including justification of choices and conclusions; and making logical predictions about which teams will win the games in Week 5.	Explanation of mathematical thinking and reasoning, including reasons for choices and discussion of conclusions.	Description of mathematical thinking and discussion of conclusions.	Statements about choices and conclusions.	Isolated statements.