



Overview

Competitors can prepare for success in games in a number of ways: they can work on their fitness, techniques and strategy. This pod explores the types of training that might be useful. If practice is important, it needs to focus precisely on skills that will be rewarded with points. This pod also explores some current scoring systems in games and asks whether they are fair.

In Activity 1.1 pupils design and carry out a simple investigation to test whether practice improves performance. They present their evidence graphically in Activity 1.2.

This is followed up in Activity 2.1 by an in-depth study of how particular athletes might prepare for competition over the period of a week. They present and compare their schedules in Activity 2.2.

In many games, accuracy is rewarded by points on a target. In Activities 3.1 and 3.2 pupils carry out an investigation to see if points on targets are fairly allocated. They collect data to produce a fairer target. League tables are designed to reward success over a series of games. Typically points will be rewarded for a win and a draw but not a loss. Pupils investigate how changing the points awarded in Formula 1 racing (Activity 4.1) and premiership football (Activity 4.2) affects match tactics and final league positions.

In Activities 5.1 and 5.2 pupils use the knowledge, skills and understanding they have gathered in the previous lessons to design and present a new scoring system for a familiar game.



Pod 1 Up to the mark

I = Information retrieval

C = Communication

T = Teamwork

M = Modelling

P = Planning

Lesson	Activity	Learning outcomes	Learning skills	Code
1 Practice makes perfect	1.1 Does practice improve performance?	Demonstrate that practice can improve performance.	Plan a simple scientific investigation.	T, P
	1.2 Presenting findings	Refine ideas based on feedback. Use data to answer a question.	Use graphics to present scientific evidence to an audience.	C
2 Training camp	2.1 Successful internet searching	Construct a training schedule for a particular sport of pupils' choice.	Refine internet searching using 'phrases'.	I, C
	2.2 Designing a training programme	Explain why each element of the schedule is needed.		
3 Targets	3.1 Target games	Comment on the scoring systems of 'target' games.	Design and use a data collection sheet.	I, P, T
	3.2 Designing a scoring system for a target game	Adjust a standard target to produce a fairer level of skill. Develop a fair scoring system for a target. Develop an understanding of fairness.		
4 League tables	4.1 How do points affect Formula 1 championship positions?	Use a spreadsheet to make calculations on a league system.	Use spreadsheets to model a situation.	I, C, M
	4.2 Premier league positions	Calculate how different points systems might affect playing strategies.	Extract data from charts, tables and lists. Interpret and discuss numerical information.	I I
5 What's the score?	5.1 Designing a new game 5.2 Presenting the game	Design a new scoring system for a familiar game.	Make and present a poster about your new game.	P, C, I, T



Overview

Throwing, catching and kicking are fundamental skills in many games. In this lesson pupils explore how these skills can be improved through practice. Working in groups they design and carry out a scientific investigation and present their findings graphically.

Lesson plan

1. Introduction (10 mins)
2. Activity 1.1 Does practice improve performance? (30 mins)
3. Activity 1.2 Presenting findings (15 mins)
4. Plenary (5 mins)

Learning skills

- Plan a simple scientific investigation. (T, P)
- Use graphics to present scientific evidence to an audience. (C)

Learning outcomes

Pupils will be able to:

- Demonstrate that practice can improve performance.
- Refine ideas based on feedback.
- Use data to answer a question.

Resources

- *Games* learning log
- Activity sheet 1.1 Does practice improve performance? Each group of three needs one of the following:
 - A Kicking accuracy
 - B Throwing accuracy
 - C Catch me quick
 - D Juggling.

Equipment and materials

Pupils investigating the effect of practice on accurate kicking will need:

- paper to make paper balls
- waste paper bin
- tape measure.

Pupils investigating the effect of practice on accurate throwing will need:

- paper to make paper balls
- waste paper bin
- tape measure.

Pupils investigating the effect of practice on quick reflexes will need:

- ruler, 30cm.

Pupils investigating the effect of practice on juggling will need:

- set of three juggling balls.

Health and safety

Carry out your own risk assessment and take suitable precautions.

To minimise risk of injury from moving objects or from falling over, there must be sufficient unobstructed space for pupils to carry out these tasks.

Introduction (10 mins)

Procedure

a Give each pupil a *Games* learning log. They will use this throughout the pod. Use the Venn diagram on the PowerPoint slide to make a list of some games requiring throwing, catching and kicking. Make the point that these are key skills in a majority of sports.

Activity 1.1 Does practice improve performance? (30 mins)

Procedure

a Allocate a skill to each group of three and give them their sheet to help them plan an investigation.



b Check that each group has a reasonable plan before you allow them to start. Make sure that each group has an appropriate table for recording their results and that they have agreed how they will present their findings graphically. Help them to make a choice based on ability. Simple bar charts will work but more able pupils might want to calculate percentages or draw line graphs.

c Get groups to allocate tasks to individuals (for example, sportsperson, judge, recorder) and carry out the investigation.

d Tell pupils to process the data and produce a graphic representation. They need to scrutinise the evidence and write down their findings.

e Pair two groups together who have worked on the same skill. Each group gives the other feedback on its investigation.

Activity 1.2 Presenting findings (15 mins)

Procedure

a Paired groups now present to the class. One person takes the lead while another person from the other group explains any differences in the approaches or findings of the two groups.

Plenary (5 mins)

Use the plenary to summarise the key elements of a fair test as exemplified by some of the group work.

Agree with the class the best ways of presenting their data.

Agree and write down three or four key 'rules' for presenting data clearly.



Overview

Because sports vary so much, highly specialised training programmes have been developed for each. In this lesson, teams of pupils develop their web-searching skills to produce a training programme based on skills, fitness, strategy and diet for a particular sport.

Lesson plan

1. Introduction (5 mins)
2. Activity 2.1 Successful internet searching (15 mins)
3. Activity 2.2 Designing a training programme (30 mins)
4. Plenary (10 mins)

Learning skills

- Refine internet searching using 'phrases'. (I, C)

Learning outcomes

Pupils will be able to:

- Construct a training schedule for a particular sport of pupils' choice.
- Explain why each element of the schedule is needed.

Resources

- Activity sheet 2.1 Successful internet searching
- Activity sheet 2.2 Designing a training programme

Equipment and materials

- One computer per pair/small group of pupils

Introduction (15 mins)

Procedure

a Tell pupils they can use the internet to research training programmes for sports. Explain that searching on this topic may bring up millions of websites. It is important to be able to find the most relevant ones quickly by refining the search.

Activity 2.1 Successful internet searching (15 mins)

Procedure

a Give each pupil a copy of Activity sheet 2.1 Successful internet searching. Use this to draw out some simple principles of searching. For example:

- Case is not important.
- When writing phrases, adding inverted commas to words such as "hockey training", refines the search to only those sites that have these words next to each other in this particular order.
- Successful searches usually include several key words.

Activity 2.2 Designing a training programme (30 mins)

Procedure

a Use the slide showing a range of different gym activities to make the point that different sports require different physical attributes. Though sports people may have innate ability, they are unlikely to reach the peak of their sport without training.

b Give pupils Activity sheet 2.2 Designing a training programme. Explain that training has four main components:

- skill training
- fitness training
- strategy training
- diet.

Get pupils to work as a team to research these four components in order. They then construct a training programme for a week.



c Allocate one of the Olympic sports to each group and tell them to begin their research.

d When they are ready, pair groups together to compare and contrast their training programmes.

Olympic sports

Archery	Field hockey	Synchronized swimming
Athletics	Football (Soccer)	Table tennis
Badminton	Gymnastics	Taekwondo
Basketball	Handball	Tennis
Boxing	Judo	Triathlon
Canoeing	Modern pentathlon	Volleyball
Cycling	Rowing	Water polo
Diving	Sailing	Weightlifting
Equestrian	Shooting	Wrestling
Fencing	Swimming	

Plenary (10 mins)

Use the plenary to identify and discuss some key differences in the training regimes of different athletes. Draw out the key explanations for why particular elements of the training are useful. The ideas here might include building strong muscles, stretching muscles, general fitness/stamina, including cardiovascular performance, improving skills through practice, building trust between team members, building confidence (sports psychology), diet for energy and building muscle, hydration and replacing salts lost in sweating.

Emphasise the importance of rest and sleep, and avoidance of drugs and alcohol within the training programme.



Overview

Pupils consider scoring systems of different 'target' games. For the game to be fair and to maintain players' interest, an effective scoring system has to reward skill while allowing players of different abilities to feel valued during the game.

Lesson plan

1. Activity 3.1 Target games (20 mins)
2. Activity 3.2 Designing a scoring system for a target game (30 mins)
3. Plenary (10 mins)

Learning skills

- Design and use a data collection sheet. (I, P, T)

Learning outcomes

Pupils will be able to:

- Comment on the scoring systems of 'target' games.
- Adjust a standard target to produce a fairer level of skill.
- Develop a fair scoring system for a target.
- Develop an understanding of fairness.

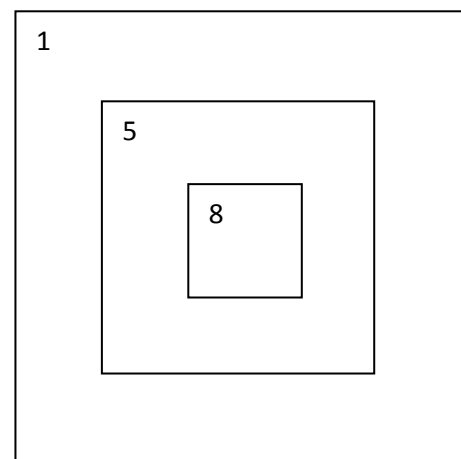
Resources

- Target games set of cards (Activity sheet 3.1)

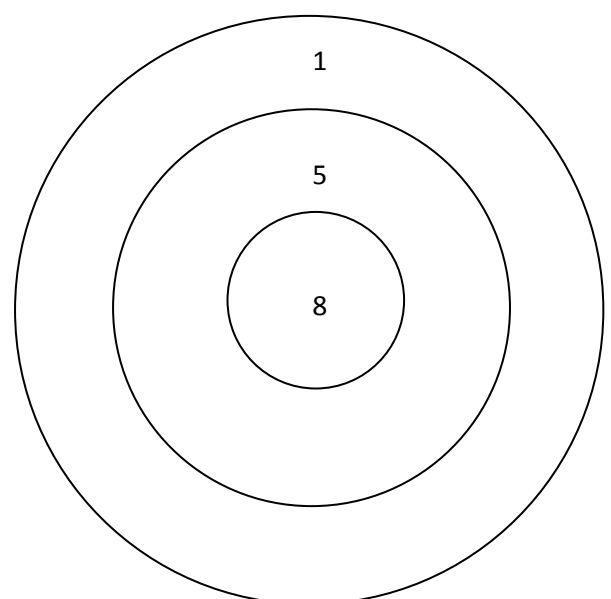
Equipment and materials

- Ready-made targets for initial investigation printed on A3 paper. Teachers will need to prepare these in advance. These can come in different forms to allow differentiation.

Concentric squares (easy to find areas of different sections by counting squares or by formula)

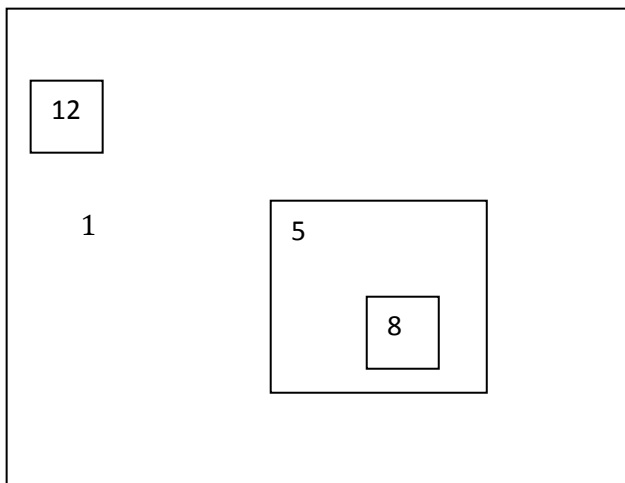


Concentric circles (you can tell pupils the formula for area of a circle, and suggest they use $\pi \approx 3$. Area answers in terms of π may be beyond year 7)





A more random target (see picture) where pupils can consider strategy and the effect of different scoring systems for the different squares, not purely based on area



Activity 3.1 Target games (20 mins)

Procedure

- Organise pupils into groups of four. Give each group a set of target games cards (shove ha'penny, curling, darts, bowls, archery, golf). The cards include a picture of the game being played, the objectives of the game and the rules for scoring in each game.
- In their groups pupils discuss if they think the rules for scoring are fair. They should write down their group's definition of 'fair', as it applies to target games.
- Bring groups together for a whole-class discussion on fairness in games and on rewarding skill.

Activity 3.2 Designing a scoring system for a target game (30 mins)

Procedure

- Give each group of four one of the suggested targets for a 'coin tossing' game.
- Tell the groups they need to devise a fair scoring system, provide a set of rules for producing identical

targets for fair comparison of results between players, and a system for pooling group results.

- Pupils should design a table to record and calculate the scores, for example how often coins fall in particular areas.
- Allow pupils some time to get used to their equipment. Once they have got the hang of it they should play it several times, writing down their scores in the table.
- Bring the class together for discussion. Include comparability of results from individual groups using the same target and the effect of pooling results from groups. The key notion is that an average group score can be used, and scoring systems can be devised to reward skill and strategy rather than luck.
- Get pupils to redesign their targets or scoring system on the basis of their trial competition. The scoring system should reward skill and strategy rather than luck. They should be moving towards the idea that the smaller the section of the target the higher the score allocated. Also, as in darts, a game that aims for a particular score rather than the highest score involves strategy and skill. It is up to the teacher to decide how quantitative their response is to this.

Plenary (10 mins)

Bring the class together to discuss how successful their modifications have been. Discuss darts as an example of a target game where strategy as well as skill is important. If there is time let the pupils swap games and play them to judge whether the scoring system is fair.



Overview

In this lesson pupils use formulae on spreadsheets to investigate how league positions can change, depending on the allocation of points for a win, draw, or lose. They extend this idea by considering how competitors might modify their game strategy to benefit most from the league system.

Lesson plan

1. Introduction (5 mins)
2. Activity 4.1 How do points affect Formula 1 championship positions? (25 mins)
3. Activity 4.2 Premier league positions (25 mins)
4. Plenary (5 mins)

Learning skills

- Use spreadsheets to model a situation. (I, C, M)
- Extract data from charts, tables and lists. (I)
- Interpret and discuss numerical information. (I)

Learning outcomes

Pupils will be able to:

- Use a spreadsheet to make calculations on a league system.
- Calculate how different points systems might affect playing strategies.

Resources

- Activity sheet 4.1 How do points affect Formula 1 championship positions?
- 'Pod 1 Premiership 2009-10 results spreadsheet.xlsx'

Equipment and materials

- IT access – one computer between two

Introduction (5 mins)

Procedure

a Get a feel for the pupils' knowledge of how league tables for different sports work. Suggest that the points allocated to a win, loss or draw might affect teams' strategies as well as overall league positions.

Activity 4.1 How do points affect Formula 1 championship positions? (25 mins)

Procedure

- a** Give each pair Activity sheet 4.1 How do points affect Formula 1 championship positions? These show drivers' positions in each race, and the number of points achieved by drivers in the 2008/9 and 2009/10 seasons. Explain that the scoring system changed for 2009/10.
- b** Get half the class to recalculate the drivers' scores in 2008/9 using the 2009/10 scoring system. Get the other half of the class to calculate the 2009/10 scores using the 2008/9 system.
- c** Two pairs join and discuss whether the points system affects all drivers in the same way or if the winners, the middle positions or drivers at the lower end of the table are affected more. Ask the groups to discuss the advantages and disadvantages of the old and new points systems.
- d** Bring groups together for a whole-class discussion on the different scoring systems in Formula 1 racing. Widen the discussion to different sports such as football, hockey and rugby and discuss how scoring systems can affect league position, for example the football premier league scoring is 3 points for a win, 1 point for a draw and 0 for a loss.



Activity 4.2 Premier league positions (25 mins)

Procedure

a Get pupils in pairs to open up the premiership table spreadsheet. In pairs they interrogate the final position of teams in the league using a different points system. Allow pupils to choose their own points system for win/draw/lose noting their choices. Ensure that there is a range of different win/draw ratios in the class for the plenary. The instructions are in the spreadsheet.

b Collate results of new league positions as each pair completes the task. While you are collating the results to display for the plenary, ask pairs then fours to discuss:

- the effect on playing strategy if their points scoring system was adopted.
- how other factors could be rewarded with points in the league, for example rewarding sportsmanship (no yellow or red cards in football) or possession time.

Plenary (5 mins)

Bring the class together for discussion of results; display the results from using different win/draw ratios on a large spreadsheet. Discuss:

- how the points for win/draw/lose affect league position over a season
- how different points systems may affect playing strategies
- how spreadsheets allow this type of modelling, removing the drudge of repeated calculations.



Overview

In this lesson pupils use the knowledge, skills and understanding they have developed in the earlier pods to design a new scoring system for a familiar game. The purpose of this is to make the new game accessible to a new group of participants. They also consider how success over a series of games is rewarded in a league or competition.

Lesson plan

1. Introduction (5 mins)
2. Activity 5.1 Designing a new game (30 minutes)
3. Activity 5.2 Presenting the game (20 minutes)
4. Plenary (5 mins)

Learning skills

- Make and present a poster about your new game. (P, C, I, T)

Learning outcomes

- Design a new scoring system for a familiar game. (P, C, I, T)

Resources

- Activity sheet 5.1 Designing a new game
- Activity sheet 5.2 Presenting the game

Equipment and materials

- Poster paper
- Felt pens
- Pencils
- Scissors
- Glue

Introduction (5 mins)

Procedure

a Explain to the pupils that their brief is to design a new scoring system for a familiar game. The new scoring system must make the game more appealing to a new audience. For example it might be a quick version that could be played in a coffee break.

Activity 5.1 Designing a new game (30 mins)

Procedure

- a** Give pupils Activity sheets 5.1 Designing a new game and 5.2 Presenting the game. Explain that the game's rules must not be changed except in the ways described on the pupil's sheet and slide.
- b** Use the next slide to discuss some possible ideas to help pupils define the purpose of their new game. For example, a game for a children's party.
- c** Let pupils work in small groups on their scoring system and provide them with any equipment they need to make a poster about their game.
- d** Suggest that pupils refer to the criteria in Activity 5.2 as they produce their poster.

Activity 5.2 Presenting the game (20 mins)

Procedure

- a** When groups have completed their posters they display them on a notice board. They use Activity sheet 5.2 Presenting the game to give feedback on each other's work.
- b** To reduce the time this takes, pairs of groups should present to one other group and feed back.

Plenary (5 mins)

Use the plenary to discuss which scoring systems are most likely to be effective at what they set out to do. Are there any general principles for designing good scoring systems? Also get pupils to reflect on their learning over the pod through their learning log.