

Learning for Life and Work through

Maths



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Learning for Life and Work through Maths

Introduction

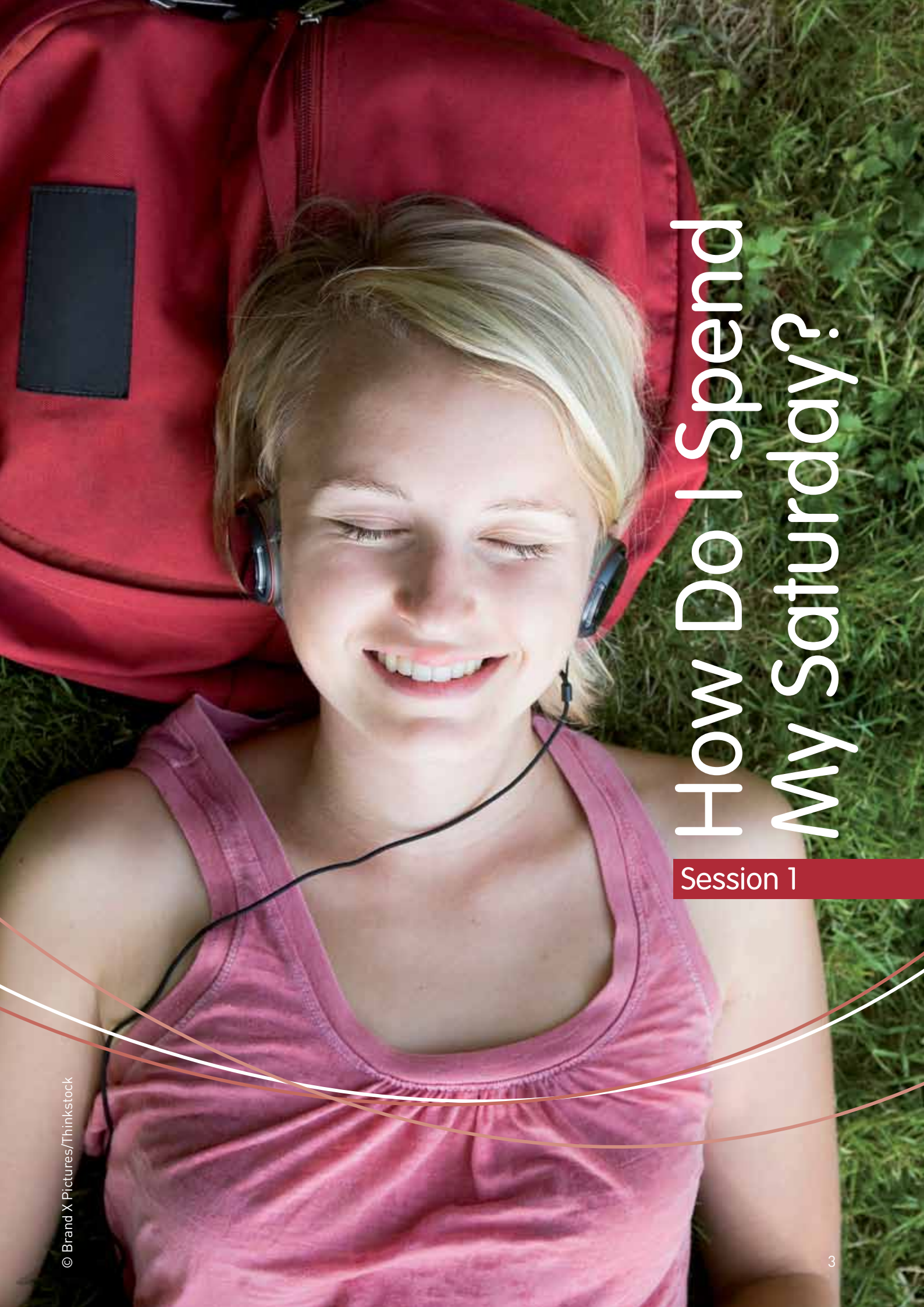
The purpose of this integrated activity is to give an opportunity for maths teachers to deliver aspects of Learning for Life and Work (LLW) in their classroom.

It also identifies aspects of Thinking Skills and Personal Capabilities development that are most relevant to each session.

The activity is aimed at Key Stage 3 pupils working towards Levels 3 to 6 in the Levels of Progression for Using Maths. Resources have been differentiated to allow for varying abilities.

Using Maths is addressed through collecting and recording data, drawing and interpreting pie charts, interpreting bar charts, changing fractions to percentages and percentages to fractions and calculating fractions and/or percentages.

For the purposes of classroom management this activity has been divided into four sessions. It is estimated that the entire unit will take four hours.



How Do I Spend My Saturday?

Session 1

Session 1: How Do I Spend My Saturday?

This activity poses the question 'Do you waste your time on a Saturday'. Many parents/guardians will say that on a Saturday, their teenagers sleep all morning and waste the rest of the day playing computer games or on social networking sites. This session gives pupils an opportunity to review and discuss their Saturday activities and the reasons why they choose to do them for example, many pupils may feel that they deserve a lazy day after a school week. Some studies actually show that teenagers need that long weekend lie in!

<http://news.bbc.co.uk/1/hi/magazine/7932950.stm>

Pupils discuss ways to categorise how they spend their time over 24 hours on a Saturday and how they will record the length of time spent on each of the categories. It is important to encourage them to record what they normally do and not to be influenced by the class discussion for example, some pupils may feel pressured to lie about when they actually get up, or how much time they spend studying.

Learning Intentions

Pupils will be learning about:

- how to collect and collate data on how they spent time on a Saturday.

Pupils will be able to:

- keep a personal diary over 24 hours to record how they spend their time.

Thinking Skills and Personal Capabilities

Managing Information is evident through:

- *Finding and selecting sources, grouping, sorting and evaluating information and recording and adapting information* when deciding how to record and collate information about how they spend their time on a Saturday.

Learning for Life and Work

- Personal Development – Self awareness contributing to developing skills and strategies to improve one's own learning.

Using Mathematics

Requirements

- Use mathematical knowledge and concepts accurately.
- Work systematically and check their work.
- Identify and collect information.

Knowledge and Understanding

- Handling Data
- Shape, Space and Measures

Activities

During this activity pupils will be developing the skill of **Managing Information**, by:

- Finding and selecting sources
- Grouping, sorting and evaluating information
- Recording and adapting information

1.1 Whole Class Discussion

Discuss the following with the pupils:

Your Mum says 'Every Saturday you sleep till midday and spend the rest of the day playing computer games. What a waste of a day! Why don't you do something more constructive?'

Does this sound familiar? Is it true? If it is true, is this OK, as it is your choice?

Discuss with pupils how they decide how to spend their time during a Saturday. Ask how they might show whether the statement above is true or not.

Ask pupils in your class to record how they spend their time on a typical Saturday. Discuss how to categorise the activities that they normally take part in. As a class, agree these categories and whether to round times to the nearest hour, half hour or quarter hour.

Discuss the design of a suitable data collection sheet. More able pupils may decide to use a table to record activities every hour over 24 hours and then collate this information on a second table. For less able pupils, distribute '*How I Spent My Saturday*' (Resource 1) and discuss how the pupils will complete these tables.

1.2 Individual Pupil Activity

Over the weekend, pupils complete a table showing how long they spent on different activities on Saturday.

Debrief

Ensure that all pupils have either designed a suitable data collection sheet or know how to use Resource 1. Explain that in the next session, pupils will use this information to decide if they use their time constructively on a Saturday and to consider the implications of part-time employment on their use of time.



A Saturday Job – Is it Worth it?

Session 2

Session 2:

A Saturday Job – Is it Worth it?

In this activity pupils take the information collected from Session 1 and use it to reflect on their use of time on a Saturday. Were 'Mum's' accusations correct or not? Can they justify how they spend their day? Do adults and teenagers have the same attitude towards what constitutes a 'waste of time'?

Pupils go on to discuss how they would find time for a Saturday job. They create another pie chart to show how a Saturday job would change how they spend their time. They use the chart to help discuss the advantages and disadvantages of having a part-time job.

Learning Intentions

Pupils will be learning about:

- the regulations regarding employment of young people in Northern Ireland;
- the advantages and disadvantages of a young person having a Saturday job.

Pupils will be able to:

- draw a pie chart using their own data;
- use evidence from their pie charts to decide if a Saturday job is right for them.

Learning for Life and Work

Employability

- Career Management – contributing to exploring the changing concept of career.

Thinking Skills and Personal Capabilities

Managing Information is evident through:

- *Recording and adapting information* when displaying own data in pie charts;
- *Grouping, sorting and evaluating information* when comparing two pie charts in order to make a decision.

Thinking, Problem Solving and Decision-Making is evident through:

- *Examining evidence, analysing multiple perspectives and making decisions* when making a reasoned decision regarding part time employment.

Working with Others is evident through:

- *Learning with and from others* when listening actively and sharing opinions in group discussion.

Using Mathematics

Requirements:

- Use mathematical knowledge and concepts accurately.
- Work systematically and check their work.
- Read, interpret, organise and present information in mathematical formats.

Knowledge and Understanding:

- Number and Algebra
- Shape, Space and Measures
- Handling Data

Activities

2.1 Whole Class Discussion

Discuss with pupils how successful they were at recording their use of time over 24 hours. Were the chosen categories suitable for this purpose? Were they surprised by the total amount of time spent on any of the categories? From the raw data, did they think that the Mum's statement from Session 1 was true for them?

Discuss with the class how best to display the data in order to draw conclusions more easily and compare data with others. More able pupils should suggest a pie chart while less able pupils may do so with some prompting.

During this activity pupils will be developing the skill of **Managing Information**, by:

- Recording and adapting Information

2.2 Individual Pupil Activity

Pupils use the information gathered from Session 1 to complete a pie chart showing how they used their time on the previous Saturday. Provide pupils with a copy of 'Pie Chart Template' (Resource 2a, 2b or 2c depending on ability). Lower ability pupils who use Resource 2c will shade in sections of the pie to correspond with the time of day that they carried out that particular activity. The completed chart will therefore not be a conventional pie chart where the total times for each activity are grouped together. If required, these pupils can count the sections for each activity to get totals. Pupils who use this template will need some support when interpreting the conventional pie charts in Sessions 3 and 4.

More able pupils may choose to group together the time spent doing a particular activity and display this accordingly on the pie chart. Resource 2A or 2B could be used to assist this process.

2.3 Whole Class Discussion

Discuss with pupils what the pie chart shows. Prompt questions could include:

- Was the Mum's statement from Session 1 correct?
- How much time did you 'waste'?
- Do adults and teenagers have the same attitude towards what constitutes a 'waste of time'?
- How much time did you spend on healthy pursuits for example, exercise, sport?
- How much time did you spend on 'productive' activities for example, housework or studying?
- How much time did you spend 'relaxing'?
- What conclusion can you come to about your use of time on a Saturday?

Lead the discussion around to the possibility of using some of their time to earn money.

Ask pupils if they have a part-time job. Use their replies to discuss the advantages and disadvantages of a 14 year old giving up some of his/her free time to earn money. Using 'Employment of 13 – 15 Year Olds in Northern Ireland' (Resource 3), discuss the reasons for the restrictions placed on employing young people in this age group.



Activities

During this activity pupils will be developing the skill of Working with Others, by:
Learning with and from others

2.4 Group Activity

Ask pupils to imagine that they are starting a four-hour job on Saturdays. In small groups, they discuss which activities they would shorten or cut out to make time for this job. Give each group a copy of *'Implications of a Saturday Job'* (Resource 4) which contains some points for discussion.

Ask each group to give some feedback to the class on their discussions and if necessary extend the discussion to consider whether some of the ideas are realistic.

During this activity pupils will be developing the skill of Managing Information, by:

- Grouping, sorting and evaluating information

2.5 Individual Pupil Activity

Having decided on how they would find time for a four-hour job, pupils draw a new table showing their use of time on a Saturday.

Using a copy of *'Pie Chart'* (Resource 2a, 2b or 2c), pupils complete a pie chart showing how they would spend their time on a Saturday if they had a job for four hours. Pupils compare the new pie chart with the one from the previous activity and note the main differences between the charts.

Ask pupils to answer the question 'A Saturday Job – is it worth it?' using evidence from their two pie charts and their group discussions.

During this activity pupils will be developing the skill of Thinking, Problem-Solving and Decision-Making, by:

- Examining evidence, analysing multiple perspectives and making decisions

Reflection

Discuss with pupils how they reached the conclusion on whether a Saturday job would be right for them. Ask if/how using pie charts helped with the decision-making process.





How Do I Spend a Typical School Day?

Session 3

Session 3:

How Do I Spend a Typical School Day?

This session encourages pupils to look at how they spend a typical school day and compare it with pupils of a similar age in Ghana and Japan. Pupils should be encouraged to discuss how long they spend in school and studying. Possible prompt questions could be:

- Do you think pupils in Northern Ireland spend too long in school?
- Should they be allowed more free time?

Children in Japan and Ghana do a lot of household chores. This could stimulate some discussion around the types of jobs young people do or should do around the house. Ask the pupils if they do any chores.

Children in Ghana may not have the same degree of access to the types of electronic games as children in Japan and Northern Ireland; this may influence how they relax. This could also lead to a wider discussion about poverty.

Learning Intentions

Pupils will be learning about:

- percentages or fractions;
- how to interpret information from a pie chart;
- how children in different countries spend their time.

Pupils will be able to:

- Calculate time spent on an activity as a fraction or a percentage.
- Calculate how long children in different countries spend on activities by interpreting pie charts.

Thinking Skills and Personal Capabilities

Managing Information is evident through:

- Grouping, sorting and evaluating information when recording how they spend a typical school day and evaluating information from pie charts.

Working with Others is evident through:

- Learning with and from others when listening actively and sharing opinions.

Learning for Life and Work

- Personal Development – Pupils should have opportunities to develop skills and strategies to improve their own learning. For example, develop self management, time management, attitudes and motivation towards learning.

- Local and Global Citizenship – Diversity and Inclusion – Pupils should have opportunities to investigate factors that influence individual and group identity for example, age, gender and youth culture and community background.

Using Maths

Requirements

- Use mathematical knowledge and concepts accurately.
- Identify and collect information.
- Read, interpret, organise and present information in mathematical formats.

Coverage and Range

- Number and Algebra
- Handling Data
- Shape, Space and Measures

Activities

During this activity pupils will be developing the skill of **Managing Information**, by:

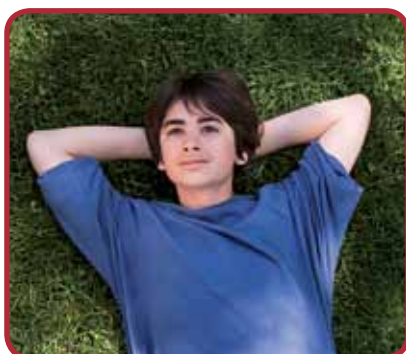
- Grouping, sorting and evaluating information

During this activity pupils will be developing the skill of **Managing Information**, by:

- Grouping, sorting and evaluating information

During this activity pupils will be developing the skill of **Working with Others**, by:

- Learning with and from others



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During this activity pupils will be developing the skill of **Working with Others**, by:

- Learning with and from others

3.1 Whole Class Discussion

Ask the pupils to think about how they spend a typical school day and then write a list of activities and how long they spend on each activity. Get the pupils to calculate what percentage or fraction of their day is spent in school, relaxing, eating, etc.

3.2 Individual Pupil Activity

Give the pupils *Callum's Day* (Resource 5a or 5b depending on the ability of the pupils). Ask them to study the pie chart of Callum's day, answer the questions, comparing his time management to their own.

Ensure that pupils understand that this pie chart shows the proportion of the day spent on different activities. Less able pupils, who used Resource 2c, may get confused by the fact that this version of a pie chart does not reflect when these activities were carried out in the 24 hour period.

3.3 Whole Class Discussion

Discuss the type of activities Callum might do when he is relaxing (for example, playing electronic games, sport, cinema etc.) and the sort of housework he could do, (washing dishes or packing the dish washer, setting the table, tidying bedroom, cutting the grass.)

Possible prompt questions include:

- How much time do you think 14 year olds should spend relaxing?
- Do you think it is appropriate for 14 year olds to do household chores?
- Do you think 14 year olds across the world have a similar lifestyle to Callum's for example, do they also do household chores and spend a similar amount of time relaxing?

3.4 Individual Pupil Activity

Give the pupils *Narki and Tomoko's Days* (Resource 6a or 6b depending on the ability of the pupils). Ask the pupils to compare the pie charts for the three pupils and answer the questions on the resource sheet.

3.5 Whole Class Discussion

Give pupils the *Fact sheet about Life in Japan and Ghana* (Resource 7). Discuss the activities that Narki and Tomoko might do when they are relaxing.

Activities

Prompt questions include:

- What do you notice about how pupils relax in Ghana and Japan?
- What do you think influences what they do when they are relaxing?
- Which pupil most reflects you and why?
- Can you find another aspect of the pupils' lives that differs from yours?
- Why might this difference exist?

3.6 Reflection

- Discuss how Narki and Tomoko's lives compare with Callum's and your own lives.
- Discuss how pupils' lives would be different if they lived in Ghana or Japan.
- In which country would pupils prefer to live? Ask for reasons why.
- Are pupils glad they live in Northern Ireland? Why/why not?



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School Attendance and Child Labour

Session 4

Session 4: School Attendance and Child Labour

In this session pupils will be looking at the percentages of children who attend school in some countries across the world. The pupils should be encouraged to discuss why in some countries school attendance is very low. The issue of child labour should then be introduced and discussed. A fact sheet has been provided but it would

be beneficial for the pupils to do some research on this topic either as a preparation homework or by linking with another curricular area such as Citizenship to connect the learning. Pupils write a short report/poster on child labour using the statistics provided and the research they have carried out.

Learning Intentions

Pupils will be learning about:

- Interpreting information from a bar chart;
- School attendance in different countries; and
- Child labour.

Pupils will be able to:

- Interpret information about percentage school attendance from a bar chart;
- Write large numbers in figures;
- Write one number as a fraction of another in its lowest terms;
- Change a simple fraction to a percentage; and
- Calculate percentage decrease.

Thinking Skills & Personal Capabilities

Managing Information is evident through:

- *Grouping, sorting and evaluating information*, by evaluating information from a bar chart and a fact sheet.

Working with Others is evident through:

- *Influencing and Negotiating* by listening actively and sharing opinions.
- *Learning With and From Others* by giving and responding to feedback.

Learning for Life and Work

- Local and Global Citizenship – Human Rights
Pupils should have opportunities to investigate local and global scenarios where human rights have been seriously infringed, for example, child labour.

- Local and Global Citizenship – Equality and Social Justice

Pupils should have opportunities to investigate how and why some people may experience inequality on the basis of their material circumstances in global contexts.

Using Maths

Requirements

- Use mathematical knowledge and concepts accurately.
- Identify and collect information.
- Read, interpret, organise and present information in mathematical formats.

Coverage and Range

- Number and Algebra
- Handling Data

Activities

During this activity pupils will be developing the skill of Managing Information, by:

- Grouping, sorting and evaluating information

4.1 Individual Pupil Activity

Give the pupils *School Attendance* (Resource 8). Ask the pupils to look at the bar chart and answer the questions that follow.

4.2 Whole Class Discussion

Narki is very fortunate that she goes to school. A lot of children in Ghana and other countries do not go to school. Discuss with the class what other countries they might expect to have low school attendance. Ask the pupils why they think children might not go to school in these countries. For example, they could be out working to earn money for the family, it might cost too much, there may not be a school near them, they might be ill. Ask pupils to discuss how this could affect the future prospects of these children, their families and the economy of their country using the answers to the questions from Resource 8 to help structure their responses.

During this activity pupils will be developing the skill of Managing Information, by:

- Grouping, sorting and evaluating information

4.3 Whole Class Discussion

Give the pupils *Fact Sheet – Child Labour* (Resource 9).

Discuss the statistics with the class.

- How many children were working in 2004?
- What is the percentage decrease of child labourers from 2004 to 2010?
- What fraction of child labourers are involved in hazardous work?
- What percentage of child labourers do not get paid?
- What percentage of children in the world are involved in child labour?

Talk briefly about the type of work children might do for example, agricultural, working in mines etc. Ask them why some work is hazardous for children.

During this activity pupils will be developing the skill of Working with others, by:

- Influencing and negotiating
- Learning with and from others

4.4 Group Activity

Tell the pupils that they are going to work in groups to write a short report or design a poster about child labour. The pupils should be encouraged to do further research to expand on the information they have been provided with. This could be done as a homework or as part of a connected learning approach with another subject. The report/poster should include statistics about child labour. Depending on the ability of the pupils you might ask them to provide the statistics in percentages and/or fractions. Encourage the pupils to write all the numbers in figures. Each group presents their report to the class, referring to and explaining the statistical information they have included and its implications.

4.5 Conclusion

Discuss how the quality of a child's lifestyle is dependent upon their place of birth and culture. Encourage pupils to reflect upon their own lives:

- Do you feel fortunate that you are provided with free education?
- Give reasons for your response.

Resources



Resource 1:
How Do I Spend My Saturday?

In the space below, list the categories for activities that your class has decided on.

A large rectangular box with a decorative top border featuring a series of circles and lines, resembling a string of lights or a garland. The interior of the box is divided into 18 horizontal rows, providing space for writing activity categories.

Resource 1 (continued): How Do I Spend My Saturday?

Complete the table below showing how you spent the 24 hours from midnight on Friday until midnight on Saturday.

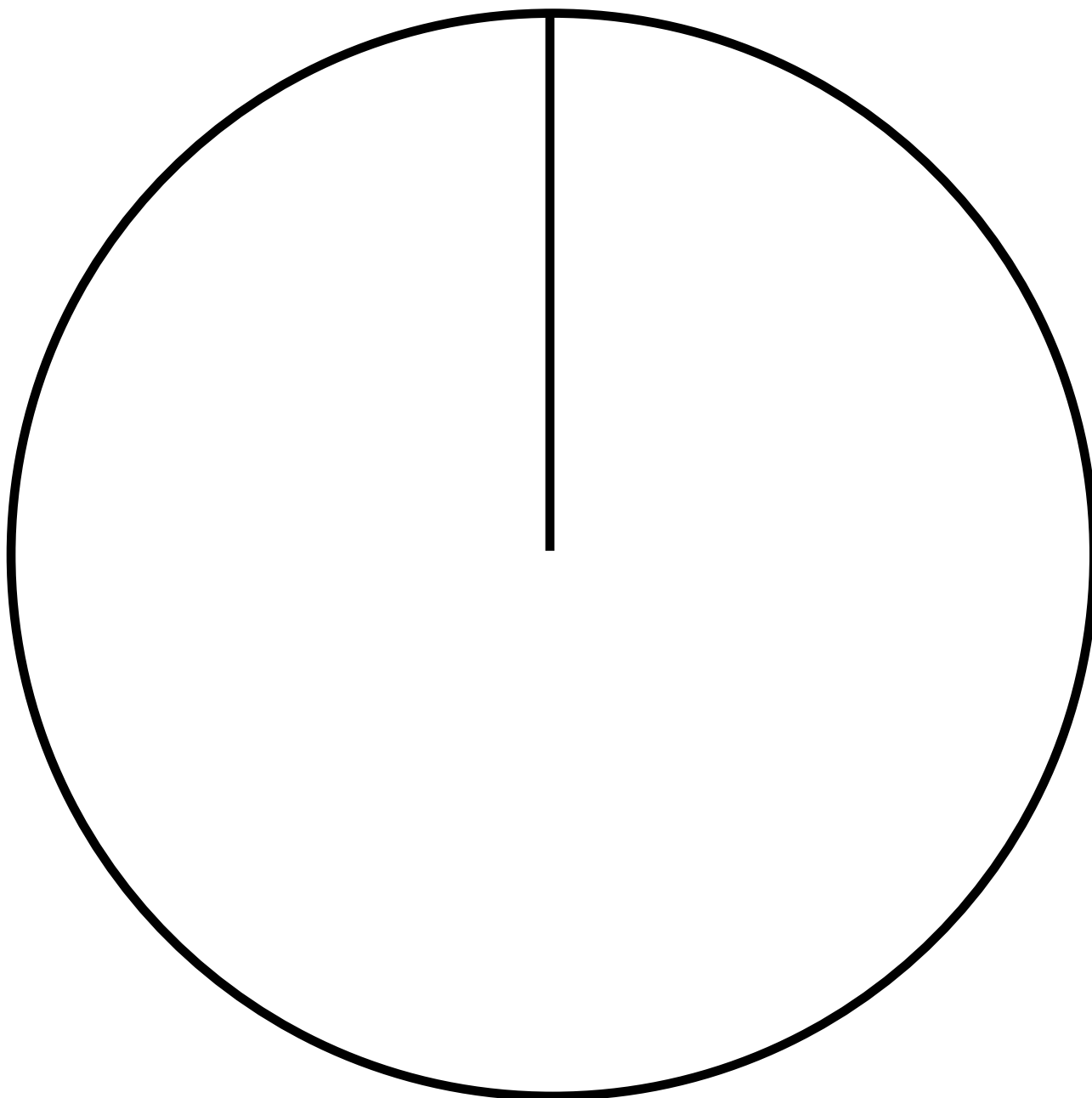
Time (24 hour clock)	Activity
00:00–00:59	
01:00–01:59	
02:00–02:59	
03:00–03:59	
04:00–04:59	
05:00–05:59	
06:00–06:59	
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23:00–23:59	

Resource 1 (continued): **How Do I Spend My Saturday?**

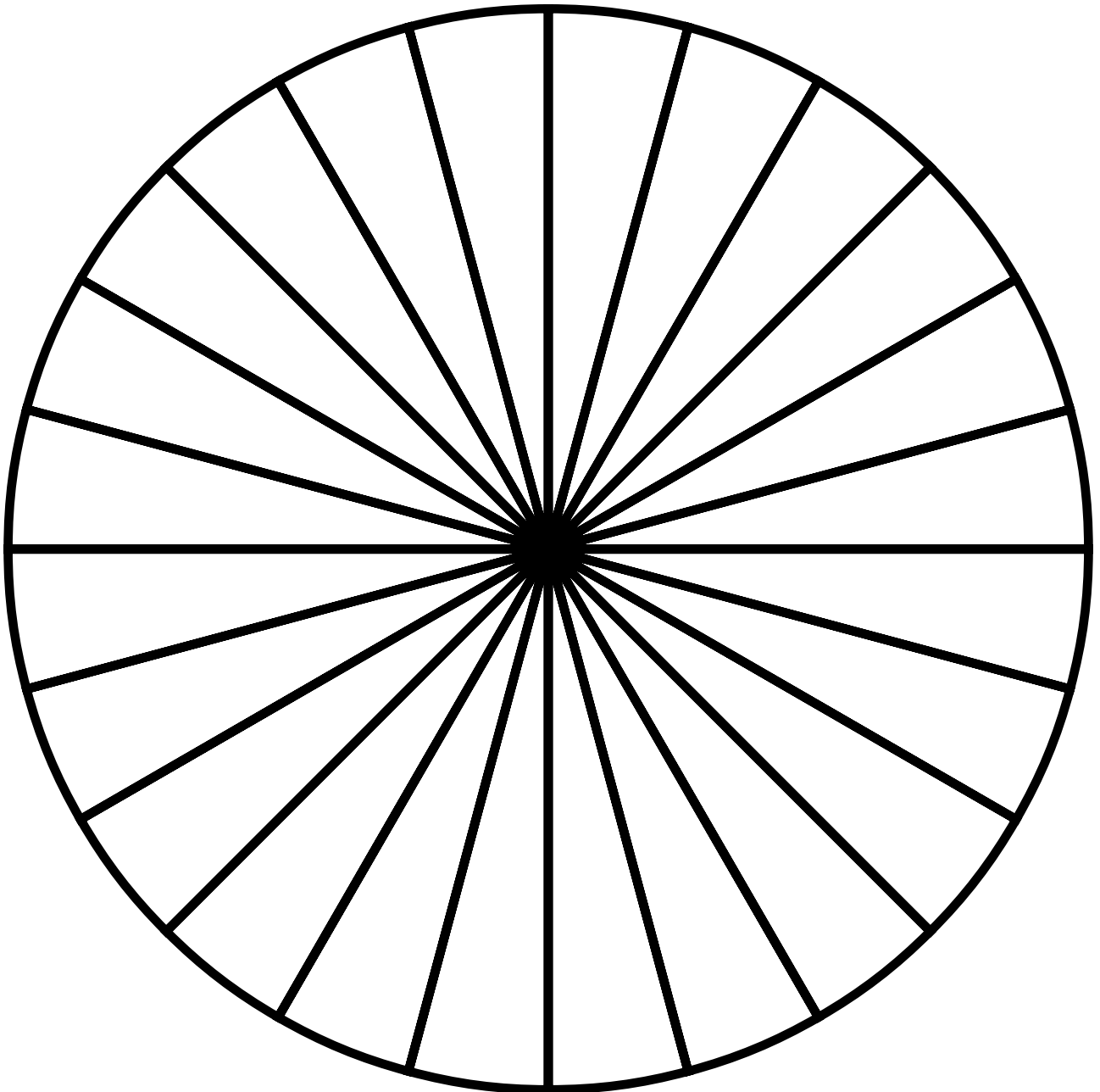
Now complete the table below showing the number of hours spent on each activity. You may have to add more rows to the table or leave some rows blank depending on the number of categories that you have.

Activity	Time Spent

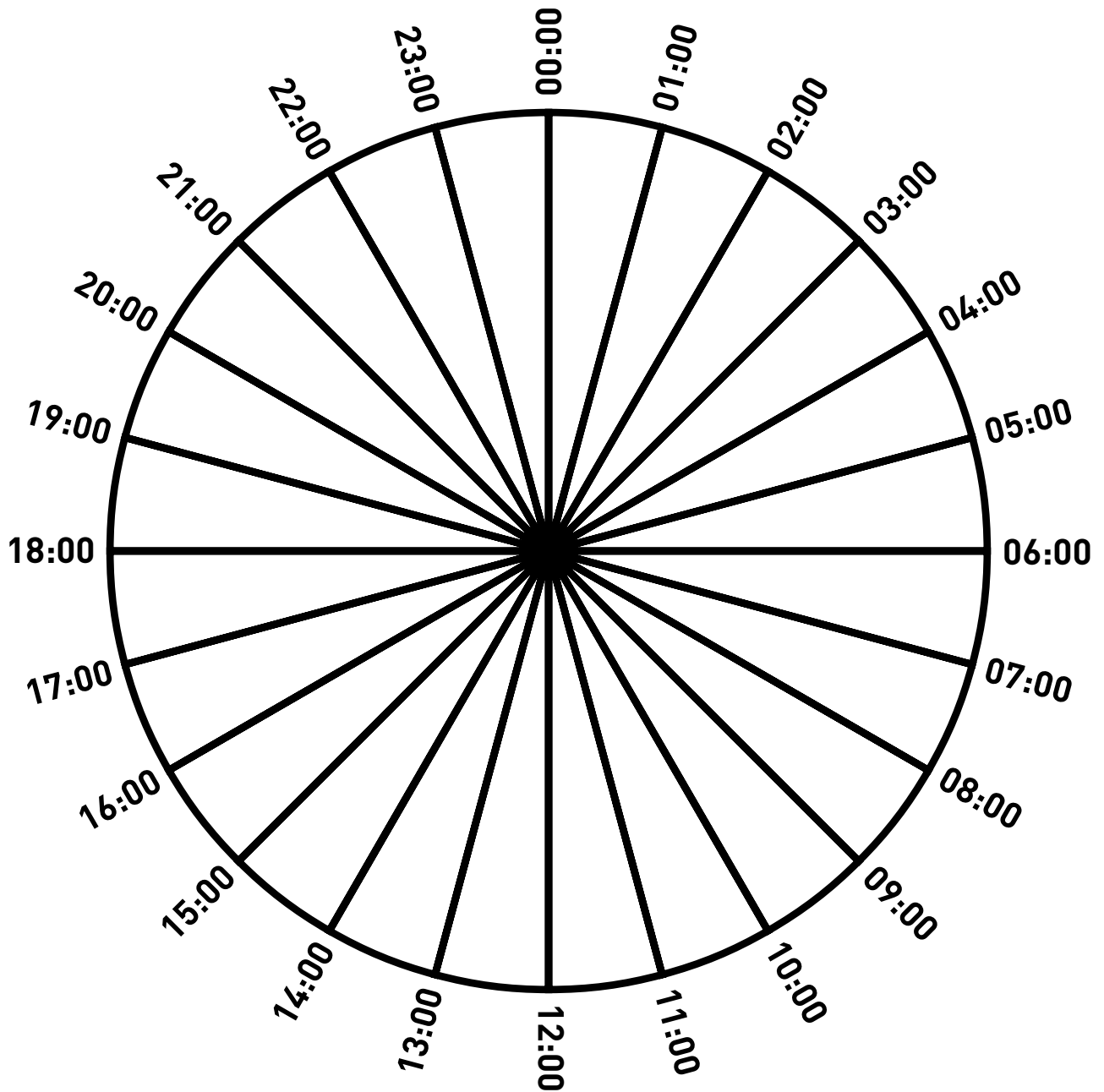
Resource 2a:
Pie Chart Template



Resource 2b:
Pie Chart Template



Resource 2c:
Pie Chart Template



Resource 3: Employment of 13–15 Year Olds in Northern Ireland

In **Northern Ireland**, young people aged **under 15** may not do any work, paid or unpaid:

- for more than one hour before school opening time and at any time between school opening and finishing time;
- for more than two hours on a Sunday or school day;
- for more than five hours on a Saturday or weekday (except on a school day);
- for more than four hours on a Saturday without taking a break of at least one hour;
- in any occupations prohibited by local bylaws or other legislation (for example, in any industrial setting, pubs, betting shops, or in any work that may be harmful to their health, well-being or education);
- for more than 27 hours in any week; and
- without the written consent of their parents.

Young people aged **between 15 and the minimum school-leaving age** may not do any work, paid or unpaid:

- for more than one hour before school opening time and at any time between school opening and finishing time;
- for more than two hours on a Sunday or school day;
- for more than seven hours on a Saturday or school day (except on a school day);
- for more than four hours without taking a break or at least one hour;
- in any occupations prohibited by local bylaws or other legislation (for example, in any industrial setting, pubs, betting shops, or in any work that may be harmful to their health, well-being or education);
- for more than 37 hours in any week; and
- without the written consent of their parents.



Resource 4: Implications of a Saturday Job

You have decided to take a job for four hours on a Saturday.

In groups, discuss the following points:

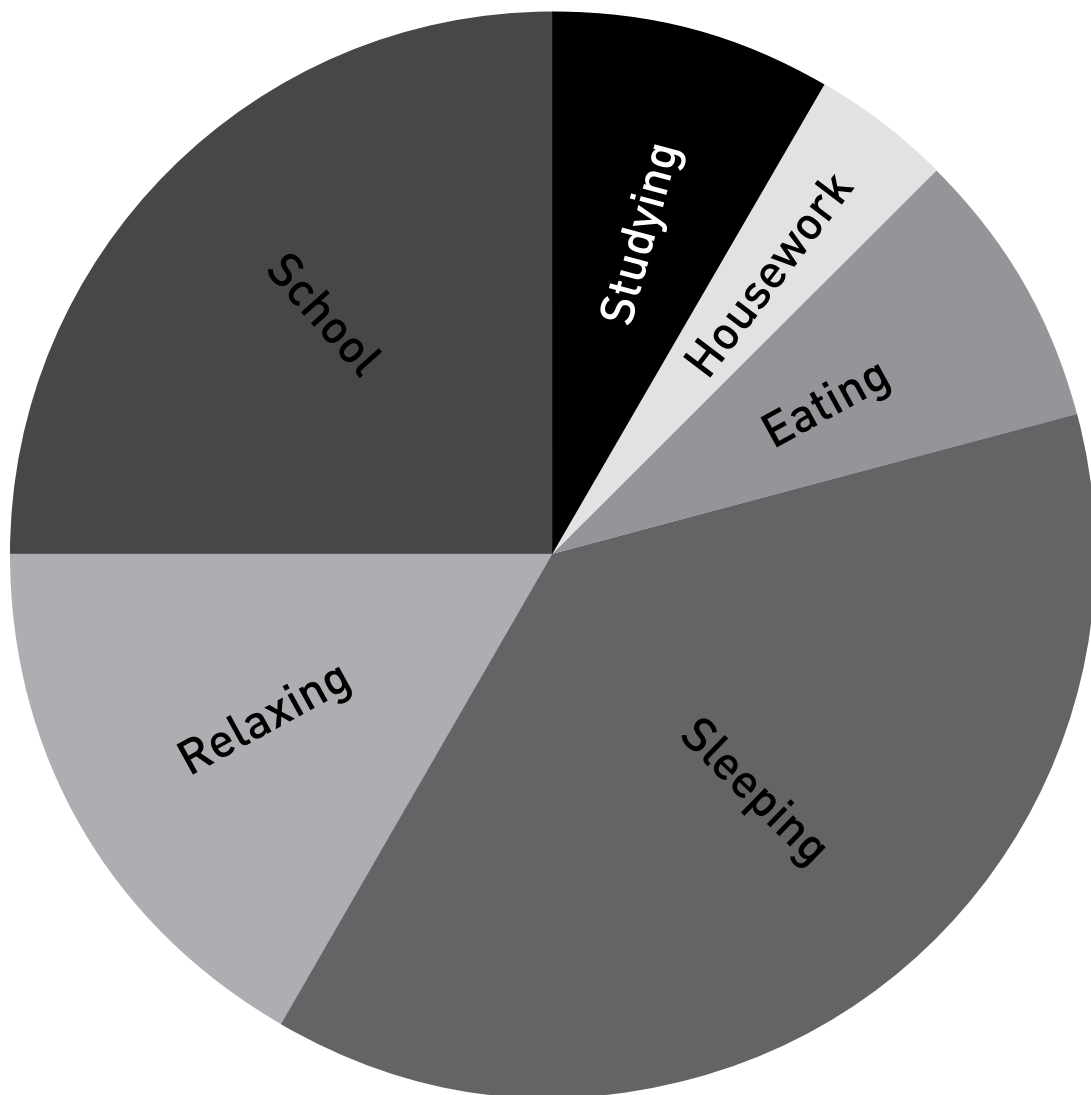
- Which activities (if any) would you be prepared to cut out completely?
- Which activities would you be prepared to spend less time on?
- Would you cut out one activity completely or take a little time from a number of activities? Why?
- How much would you have to earn to make a four hour job worthwhile?
- What impact (if any) would a Saturday job have on your:
 - social life?
 - family life?
 - school work?
 - health?



Resource 5a: Callum's Day

Callum is 14 years old and lives in Northern Ireland.

The pie chart below shows the amount of time Callum spends doing different activities on week days.

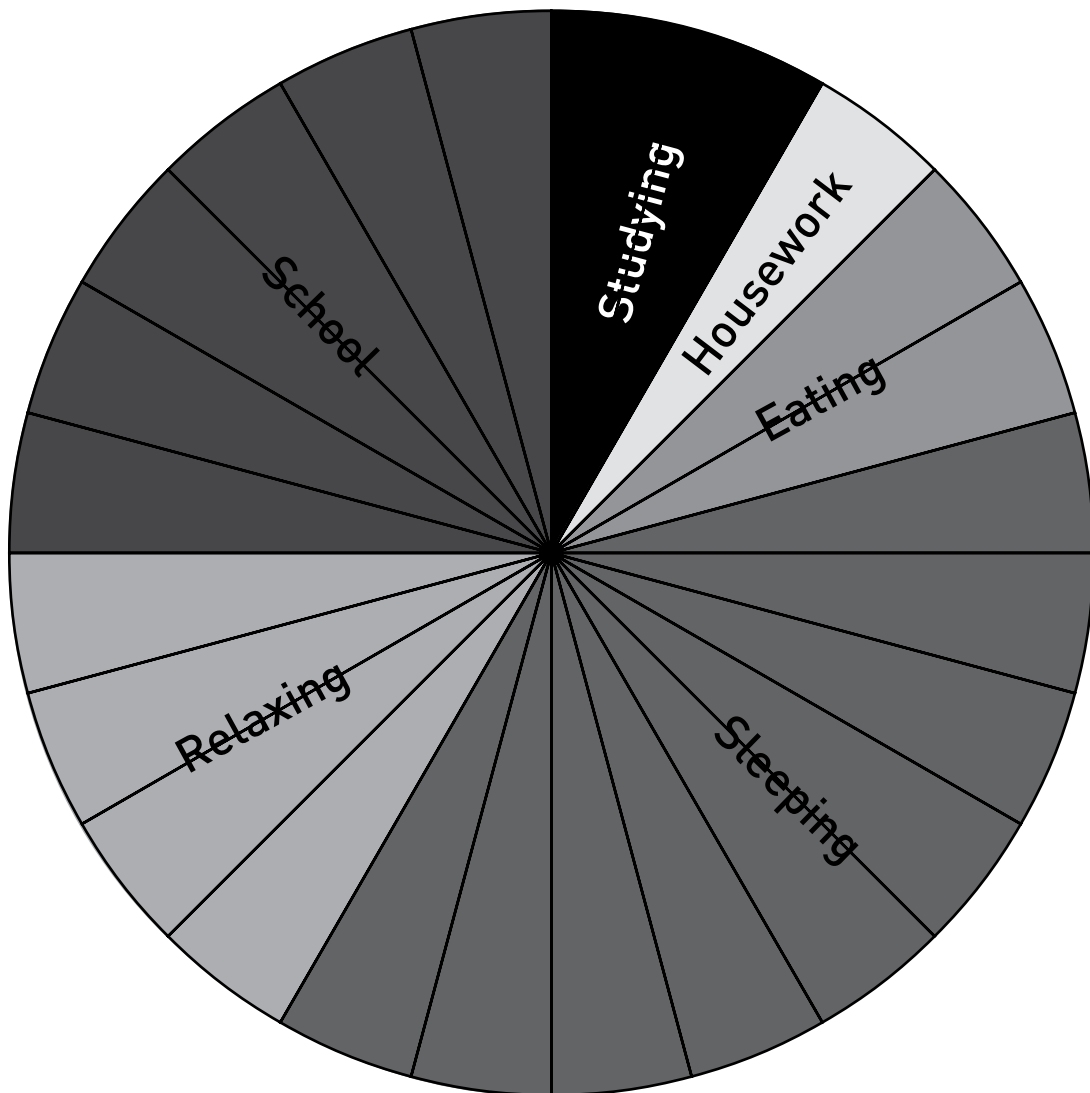


- What does Callum spend most time on?
- What does he spend least time on?
- How many hours a day does Callum spend at school?
- What fraction of his day is spent relaxing?
- Describe the difference between the pattern of Callum's day and your own.
- What conclusions can you come to about your time management and Callum's time management?

Resource 5b: Callum's Day

Callum is 14 years old and lives in Northern Ireland.

The pie chart below shows the amount of time Callum spends doing different activities on week days.

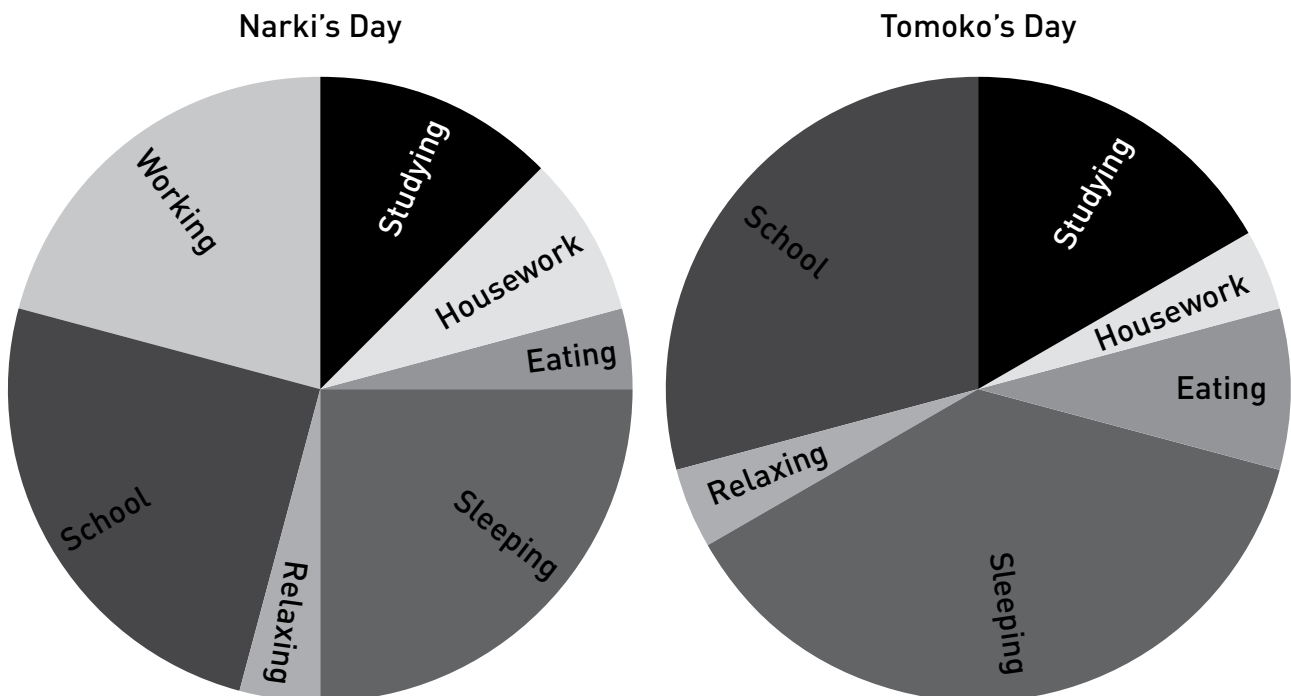


- What does Callum spend most time on?
- What does he spend least time on?
- How many hours a day does Callum spend at school?
- What fraction of his day is spent relaxing?
- Describe the difference between the pattern of Callum's day and your own.
- What conclusions can you come to about your time management and Callum's time management?

Resource 6a: Narki and Tomoko's Day

Narki and Tomoko are also 14 years old. Narki lives in Ghana and Tomoko lives in Japan.

Look at how Narki and Tomoko spend their days.

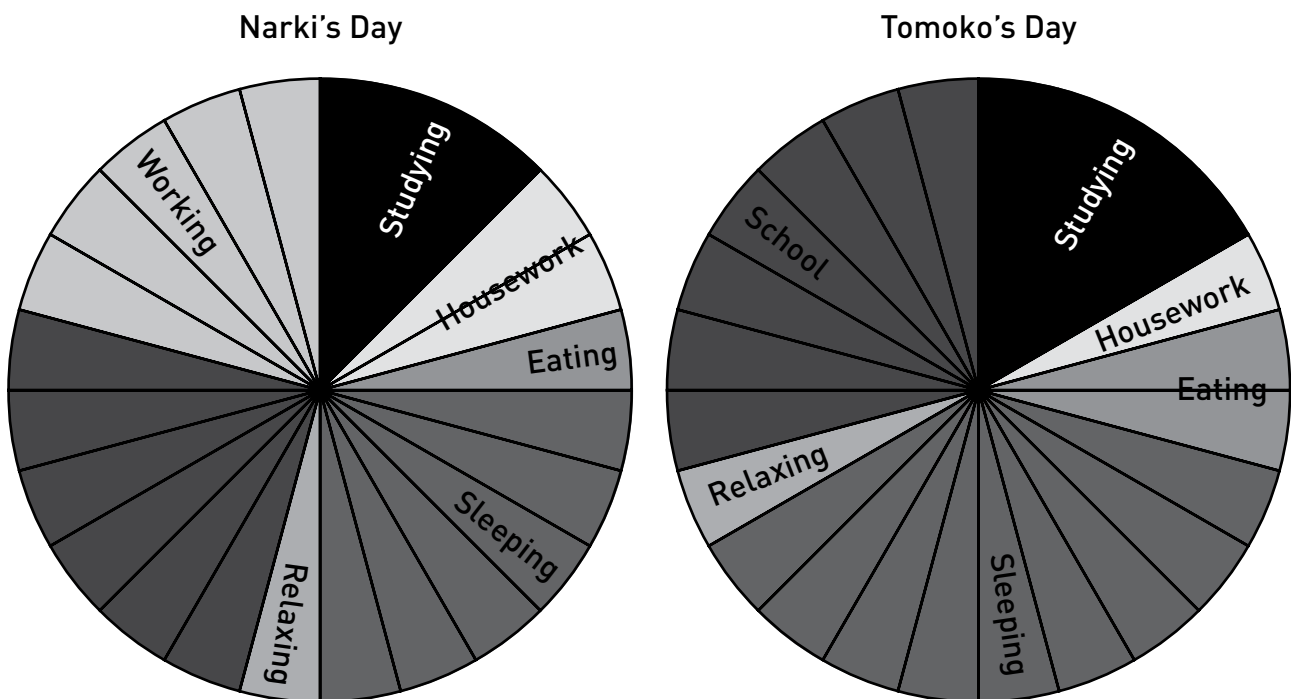


- What is the major difference between the two charts?
- Narki has to work at her parents soft drinks stall. How many hours does she spend each day working?
- Compare the amount of time Tomoko spends studying with the time Callum spends studying. Can you suggest a reason for this difference?
- Compare the amount of time Callum spends relaxing with the time the other two pupils spend relaxing. What conclusions can you draw about life for a 14 year old in Northern Ireland compared to Japan or Ghana?

Resource 6b: Narki and Tomoko's Day

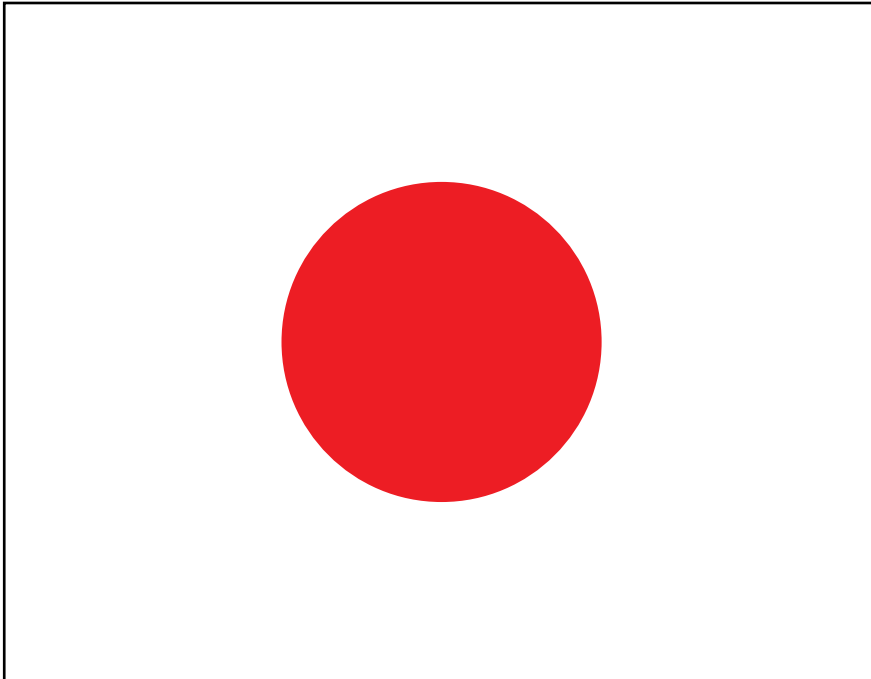
Narki and Tomoko are also 14 years old. Narki lives in Ghana and Tomoko lives in Japan.

Look at how Narki and Tomoko spend their days.



- What is the major difference between the two charts?
- Narki has to work at her parents soft drinks stall. How many hours does she spend each day working?
- Compare the amount of time Tomoko spends studying with the time Callum spends studying. Can you suggest a reason for this difference?
- Compare the amount of time Callum spends relaxing with the time the other two pupils spend relaxing. What conclusions can you draw about life for a 14 year old in Northern Ireland compared to Japan or Ghana?

Resource 7: Fact Sheet: Life in Japan and Ghana



Life in Japan

Study:

As well as school work, most Japanese students attend extra lessons for maths, another language or music.

Housework:

Tidying the kitchen, washing the dishes, cleaning the bathroom, washing the car, cooking, setting the table for mealtime, cleaning own bedroom.

Relaxation:

Sports, video games, watching television, listening to music.



Life in Ghana

Study:

Outside of school students study hard to get a good education.

Girls' Housework:

Collecting water from the borehole, sweeping the house and compound, preparing the meals, looking after younger siblings, washing clothes by hand

Boys' Housework:

Weeding, farming, pounding grain, collecting water from well

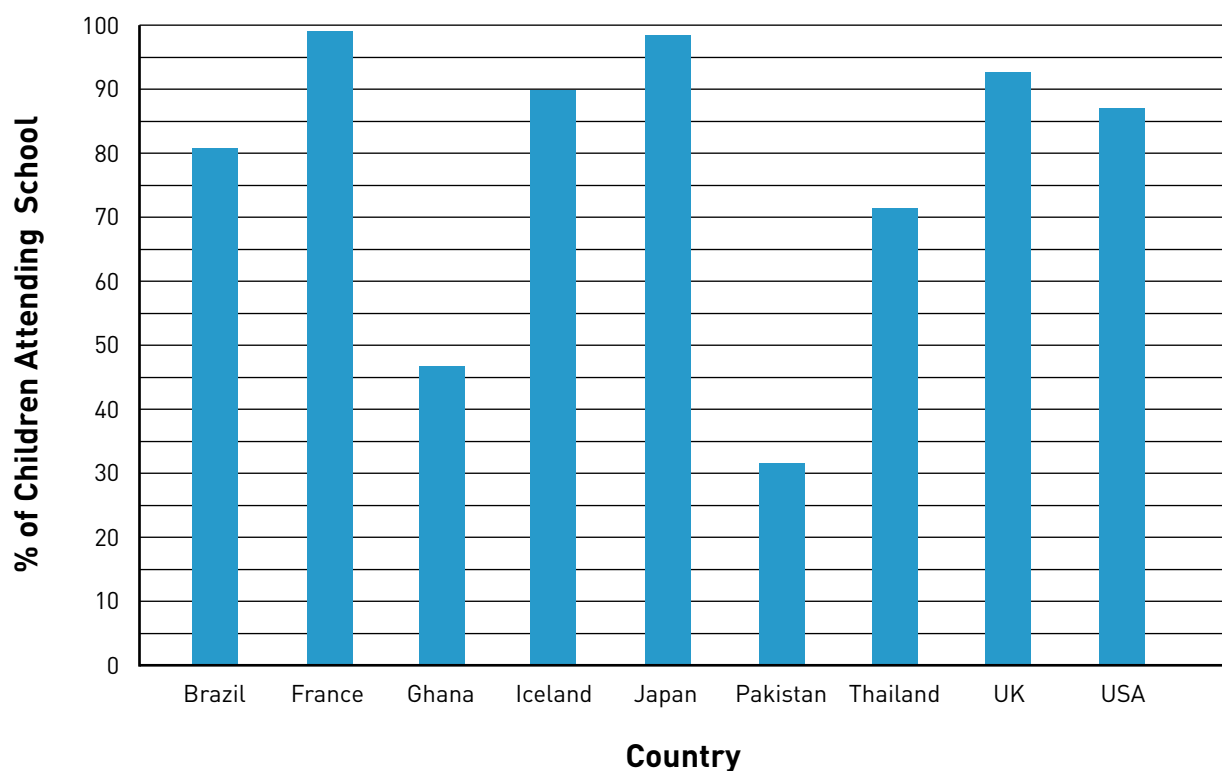
Relaxation:

Reading, watching television, playing football

Resource 8: School Attendance

Narki is very fortunate that she goes to school. A lot of children in Ghana and other countries do not go to school.

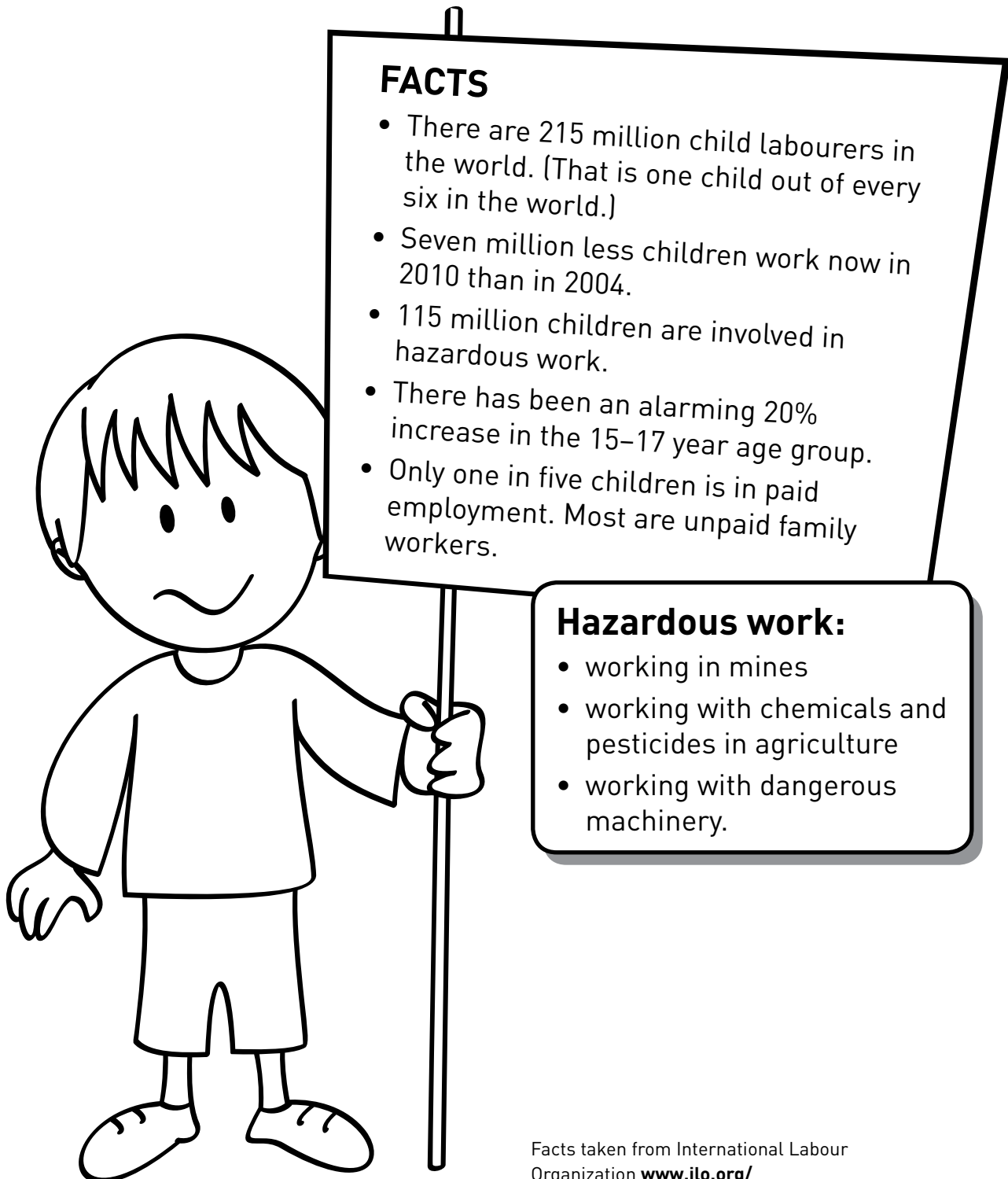
Look at the bar chart below. It shows the percentage of children of secondary school age who attend school in some different countries.



1. In which countries do 90% or more of children attend secondary school? Can you suggest a reason for this pattern?
2. In which countries do less than half of the children attend secondary school? Can you suggest a reason for this pattern?
3. Which countries have a higher percentage of children attending secondary school than the UK? Do these countries have anything else in common?
4. Thinking about the lifestyles of the three pupils in the previous activity. Why do you think countries like Ghana and Pakistan have a low percentage of children attending school?
5. What impact might the pattern of school attendance have on the employment prospects of children and the economic success of that country?

Resource 9: Fact Sheet – Child Labour

When children under fifteen are made to do work that is physically or mentally harmful and which interrupts their education or social development it is called child labour.



Notes

Notes

Notes

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