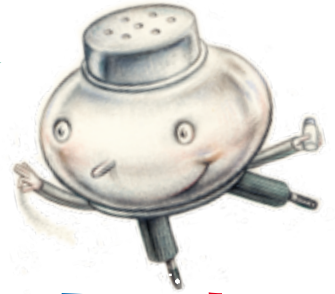


Ana Alonso

# The Rainbow Party



**Teacher's  
Book**

**Science**

**Primary  
Education**

**PINCH OF SALT**  
**A LITTLE BIT**

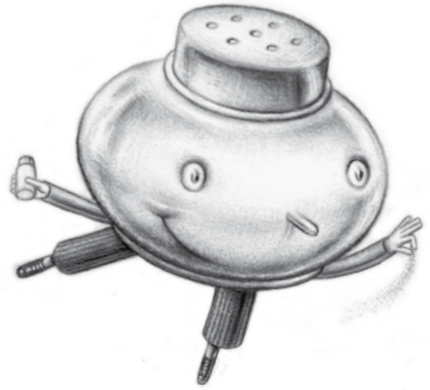
This Teacher's Book is part of the complementary materials of the Reading Plan for *The Rainbow Party* which is included in the PINCH OF SALT collection.

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# **S**ummary



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# **he PINCH OF SALT collection**

As part of its ongoing commitment to the encouragement of reading and teaching innovation, Anaya presents the **PINCH OF SALT** collection as a response to the new challenges of the education system. Intended for Primary Education, the collection combines literature with contents from different curriculum subjects. Each book handles these contents via a fictional story with a captivating and fun plot, using language appropriate for the age of the readers. The attractively designed and generously illustrated books are accompanied by ten work cards with proposed activities that may be completed individually or in groups, either at home or in the classroom.

**The author,** Ana Alonso, is a writer, poet and teacher, with a long literary background. In recent years she has published numerous books for children and young adults, including the prestigious series *La llave del tiempo* (*The Key of Time*) and *Versos piratas, piratas en verso* (*Pirate Verses, Pirates in Verse*), in Anaya, and she has received important awards, including the Hiperión Poetry Prize and the Barco de Vapor Children's Literature Award.

The **PINCH OF SALT** Reading Plan offers a new focus, based on the most recent studies on the acquisition of reading habits at an early age, as well as on the experience of numerous teachers. Thought-provoking and stimulating (with dramatisations and complementary materials written by the author herself), it has been carefully designed to encourage reading efficiently at all levels of Primary Education.

We hope that both pupils and teachers will find in these books the “pinch of salt” necessary to stimulate creativity and add excitement to our daily routine.

# PINCH OF SALT materials

## For the pupils

### The reading book

Through the story of the magical Princess Enid and her interest in science, pupils of the third cycle of Primary Education will be able to consider the **reflection** and **refraction of light**, the **decomposition of white light into colours** and the **different types of mirrors and lenses**. At the same time, they will consolidate their reading habits, acquiring new vocabulary and a better understanding of written language.

### The audio CD

The book includes an **audio CD** that contains the recording of all the chapters. By listening to the text, read by a native teacher, the students will be able to work on their word pronunciation and verify their listening comprehension skills.



### The work cards


The book includes **ten work cards** in colour that will allow pupils to complete **activities**, inside and outside the classroom. These activities are intended to complement their reading and reinforce the curriculum contents covered in the story, as well as to cover the specific needs of each pupil. The postcard included at the end of the book can be used to write to the author (preferences, suggestions...).

**6 Research**

1 Work in groups. We are going to do an experiment to separate the components of various colours.

**You will need:**  
Blotting paper, coloured felt-tip pens and a washing-up bowl.

**Procedure:**




Contents  
Colours  
Activities  
Complementary 1

**2** Look for information on the internet to answer these questions.

a) The planet **Venus** is one of the heavenly bodies in the firmament. Where does its light come from?


b) The planet **Mars** looks somewhat redder than



**10 Reading comprehension**

1 Read and listen to this text. Then work in pairs and take turns to summarise it aloud to your partner.

Two-way mirrors allow part of the light (say 10%) to pass through the mirror and they reflect the rest (say 90%). These mirrors are used in the interrogation rooms of police stations. If the suspect is in a brightly lit room and the police officers are in a dark room, the suspect can observe that the mirror reflects 90% of the light from the room, and only 10% comes from the observation room. Therefore he cannot see the police officers. From the other side the opposite occurs: the police officers see 10% of the light from the interrogation room, but as this light is very intense, it is sufficient to enable them to distinguish the suspect clearly.



Contents  
Reflection and refraction  
Mirrors and lenses  
Activities  
Extension: 1 and 2  
In group: 1  
Skills  
Reading  
Listening  
Speaking  
Writing

# For the teacher

## The Teacher's Book

The Teacher's Book includes **teaching suggestions** to help teachers make the most of the reading of the book and the work card activities, by offering guidelines for their use, organised in practical tables. It also contains other complementary materials (**assessment work**, various **dramatic games** and a **vocabulary list**).

## Teaching suggestions

- Key competences
- Area objectives
- Curriculum contents
- Methodology
- Using the work cards (including practical **tables** and **solutions**)
- Values in the book

**Teaching suggestions**

**1 Key competences**

The following key competences can be worked on using **The Rainbow Party**:

**Linguistic and communicative**

- Enrich vocabulary specific to the area.
- Be rigorous in the use of the specific terms used in this area.
- Know how to build a discourse: take care in the precision of terms, linking of ideas, verbal expression.
- Acquire specific terminology regarding living things, objects and natural phenomena.
- Understand informative, explanatory and argumentative texts.
- Transmit ideas and information regarding nature.
- Understand and produce oral messages that contain facts, k and opinions.
- Acquire writing techniques applicable to any type of document.
- Read and understand literary texts in prose and verse autome
- Participate actively in oral communicative exchanges, resp rules by which they are governed.
- Understand and use the terminology appropriate to the cyc texts, word classes, basic mechanisms of lexical formation.

**Guidelines for using the work cards**

The tables we present below provide at-a-glance information on the method of use of the work cards, indicating the types of activities proposed and the contents that can be worked on with each one of the cards.

Card Number	Competences	Contents	Activities	Skills
Card 1	Observation Clarity	Propagation of light Reflection and refraction	1 and 2: consolidation 1: interdisciplinary with Art	1: writing 2: writing and speaking
Card 2	Understanding what you have read	Reflection and refraction Lenses and mirrors Colours	1 to 5: consolidation	1 and 2: reading, listening and writing 3 to 5: writing
Card 3	Stimulating curiosity Observation	Decomposition of light Colours	1 and 2: complementary, interdisciplinary with Art	1: speaking and writing 2: writing and speaking
Card 4	Experiencing Curiosity	Propagation of light Reflection and refraction	1: extension 2: after school, interdisciplinary with Art	1: writing and speaking 2: writing
Card 5	Thinking and making connections	Lenses and mirrors Convergent and divergent lenses Decomposition of light	1 to 4: consolidation	1 to 4: writing

**Contents worked on using the work cards**

Reflection and refraction	Card 1: activities 1 and 2
	Card 2: activities 3 and 4
	Card 4: activities 1 and 2
	Card 7: activities 1 and 2
	Card 10: activities 1 and 2
Mirrors and lenses	Card 2: activities 3 to 5
	Card 5: activities 1 to 4
	Card 7: activities 1 and 2
Propagation of light	Card 10: activity 2
	Card 1: activities 1 and 2
	Card 2: activities 1 to 5
Convergent and divergent lenses	Card 4: activity 2
	Card 7: activity 1
	Card 5: activities 1 to 4
Colours	Card 2: activities 1 to 5
	Card 3: activities 1 and 2
	Card 6: activities 1 and 2
Shadows	Card 9: activities 1 and 2
	Card 3: activities 1 and 2
	Card 5: activity 4
Decomposition of light	Card 3: activities 1 and 2
	Card 9: activities 1 and 2

**Solutions to "The PINCH OF SALT work cards" (The Rainbow Party)**

**Card 1**

**1:** The pencil looks as though it is broken due to the phenomenon of refraction, which is the deflection undergone by a ray of light when it passes from one medium to another.

**2:** a) Reflection.  
b) It consists of the fact that rays of light rebound when they hit a specific surface.

**Card 2**

**1:** He supposes that it is due to the existence of a kind of microscopic fairies who live in the clouds.

**2:** The rainbow is formed because the sun's rays, when they pass through the drops of water in the clouds, which act as lenses, decompose into the seven colours that form white light, due to the phenomenon of refraction.

**3:** Distorting mirrors, shadow theatre, flat mirrors, prisms to form rainbows.

**4:** Prisms.

**5:** The prisms and some of the shadow puppets are transparent. The rest of the bodies used (mirrors, other puppets) are opaque.

**Card 3**

Various answers

**2:** a) The colours mix and the spinning top looks white.  
b) The more colours we add the greyer the top looks because the colours lose purity.

**Card 4**

**1:** a) Larger and longer than in reality.  
b) Concave.  
c) Smaller and squatter.  
d) Concave mirrors.

**2:** a) The ray is not usually where you expect due to the phenomenon of reflection.  
b) Various answers.

## The assessment work


In order to assess the acquisition of the different competences worked on via this book, we suggest that the pupils should complete some **assessment work** appropriate for their age and intended to combine the assessment of the progress made with an **entertaining** and at the same time **educational activity**. The assessment work will allow the pupils to look in greater depth at aspects covered in the reading and to become familiar with different techniques for compiling and processing information, which they will find very useful throughout their academic life.

## The PINCH OF SALT games

To work on reading comprehension and support the acquisition of curriculum contents, we offer a series of **dramatic games** that will assist pupils to revise what they have learned through reading the book.

## Vocabulary

### Vocabulary



**Absorb:** Said of a body, to amass or extinguish the radiations that go through it (including light).  
Example: *Black absorbs all colours and does not reflect any of them.*

**Against the light:** View or appearance of things from the side opposite to the light.  
Example: *As the man was sitting against the light, his face was hidden by shadows.*

**Alien:** A living creature from another planet other than the Earth.  
Example: *If Martians existed they would be aliens.*


**Concave:** Said of a line or a surface that has a curved form that is deeper in the centre than at the edges.  
Example: *I need a concave recipient.*

**Congress:** A conference, usually held on a regular basis, at which members of an association, body, organisation or profession meet to debate on previously decided matters.  
Example: *The doctor is not here because he has gone to a congress in New York.*

**Convex:** Said of a line or a surface that has a curved form that is more raised in the centre than at the edges.  
Example: *That hat has a convex shape.*

**Craters:** Hole or cavity, more or less circular, formed by a volcanic explosion or a falling meteorite.  
Example: *The moon is full of craters formed by the impact of meteorites.*

### Assessment work



The aim is to assess the learning acquired in relation with the book through team work which will consist of holding a 'rainbow party' similar to the one held in the book.

**Objectives:** To foster creativity and the acquisition of strategies for experimentation and the preparation of small devices based on the science of optics, as well as consolidating the knowledge acquired through reading *The Rainbow Party*.

**Materials:** Gold and silver card, coloured cellophane, prisms, magnifying glasses, kaleidoscopes and other optical instruments, acetate sheets and card for making puppets, primers and paper for printing, scissors, glue, string, small sticks, etc.

**Procedures:**

- In the first session, the pupils will be divided into several teams of five members and each team will be assigned one of the following objectives (or others that the teacher considers relevant) either by drawing lots or at the teacher's discretion.
  - Mirrors: this team will have to create "attractions" based on the different properties of mirrors. They can bring different types of mirrors from home or they can be given some of those available at school. They can also create concave and convex mirrors with gold or silver card, or bring spoons, stainless steel ladles or convex lenses.

### Dramatic games



These games have been designed to work on the contents of the book, while encouraging the pupils' creativity and imagination.

The first thing that the participants need to understand is that there are no "correct" or "incorrect" answers to the game. It uses an open approach where many different interpretations are possible, provided that the basic rules are respected. In this way the games not only serve as instruments for learning, but also contribute to developing the pupils' self-sufficiency with regard to the interpretation and application of rules, as well as their sense of responsibility with regard to applying them.

According to the most recent educational studies, this is, without any doubt, the most valuable contribution that the dramatic game makes to education: that of fostering self-control and the acquisition of values by interiorising a particular role within a defined game situation.

#### Game I: "From Occam to Earth"

**Materials required:**

A magnifying glass, some glasses, a prism, a cellophane stained glass window, a spotlight for projecting shadows on the wall, a mirror, other objects related with optics or colour.

**Procedures:**

- The pupils are divided into two groups: half will be citizens of Occam and the other half people from the Earth.
- The teacher will call in turns a mirror and another from the terrestrial team. He'll object mentioned in the materials set. The inhabitant of Occam must try to explain in magical terms, the terrestrial person.
  - They are all looking at the stars with the telescope and Marc appears.
  - Milena is expelled from the castle.
- The children will prepare a shadow performance of the scenarised to them. They can dress up and be the characters themselves (optional) or make puppets, but in both cases the performance will be given using shadows. It will be emphasised that the objective is not to play the scene literally, but to do so in a free and creative manner.
- The different groups will take turns to go to the front and play their scene.

**Rules of game:**

The teacher's role is to coordinate the game and motivate the pupils. The children should express themselves in their own words and mix the preparation of the scene with improvisations that arise.

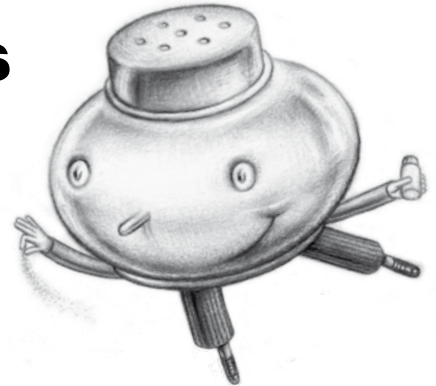
**Objective:**

Revise the contents of the book in an entertaining way.





# T Teaching suggestions



# 1 Key competences

The following key competences can be worked on using ***The Rainbow Party***:

## Linguistic and communicative

- Enrich vocabulary specific to the area.
- Be rigorous in the use of the specific terms used in this area.
- Know how to build a discourse: take care in the precision of terms, linking of ideas, verbal expression.
- Acquire specific terminology regarding living things, objects and natural phenomena.
- Understand informative, explanatory and argumentative texts.
- Transmit ideas and information regarding nature.
- Understand and produce oral messages that contain facts, knowledge and opinions.
- Acquire writing techniques applicable to any type of document.
- Read and understand literary texts in prose and verse autonomously.
- Participate actively in oral communicative exchanges, respecting the rules by which they are governed.
- Understand and use the terminology appropriate to the cycle: types of texts, word classes, basic mechanisms of lexical formation.

- Show an interest in reading, writing and speaking as instruments for relating with others and for learning.
- Adapt the meaning of words to the context.
- Look up, compile and process information.
- Evaluate literary texts as a form of communication, a source of knowledge and a resource for personal enjoyment.
- Express ideas and emotions appropriately.
- Put into practice knowledge and strategies for writing correctly, via the study of basic spelling rules, punctuation and word stress rules and the study of all the word classes.
- Understand and be able to communicate the rules for language use.
- Use language as an instrument for oral and written communication.

## **Knowledge and interaction with the physical world**

- Interpret the physical world via the concepts learned.
- Be able to define problems, consider solutions and prepare strategies.
- Design small research projects.
- Analyse results and communicate them.
- Observe the physical world, obtain information and act accordingly.
- Participate in taking decisions regarding local and global problems posed.

## **Information and communication technologies (ICT)**

- Use different search, selection, and organisation procedures and apply them in the area.
- Be able to use a computer at a basic level.
- Be able to search on the internet with guidance.
- Transform information into knowledge.

- Search for, select and save information.
- Work in collaborative environments.
- Use communication and information technologies to obtain an up-to-date view of scientific activity.

## Social and civil

- Become aware of feelings and emotions in interactions with others.
- Develop attitudes for dialogue and conflict resolution.
- Create one's own value system based on respect.
- Use language as a tool for coexistence, respect and understanding.
- Learn to communicate with others and understand what they transmit.
- Put an end to discriminatory uses of language.
- Become aware of the role of society in scientific advance.
- Know how essential debates have been produced for the advance of science in order to understand the evolution of society.

## Learning to learn

- Develop techniques for learning, organising, memorising and recalling information.
- Reflect on what has been learned and how.
- Acquire procedures for the analysis of causes and consequences.
- Handle the resources for intellectual work efficiently.
- Encourage motivation and the love for learning.
- Manage learning processes efficiently.
- Access knowledge and the construction of knowledge via language.
- Acquire essential concepts linked to our natural knowledge to incorporate information originating in the pupils' own experience or from documents or audiovisual materials.

## Cultural and artistic

- Know the cultural manifestations of our environment.
- Read, understand and evaluate literary works.
- Use library resources responsibly.
- Express oneself with imagination and creativity.



## Area objectives

### **Objectives in Science for the third cycle of Primary Education**

- Acquire and use correctly the specific vocabulary of the area in speaking and writing.
- Read and understand scientific, historical and geographic texts.
- Know some of the most important scientific advances and their consequences for the improvement of the lives and well-being of human beings.
- Show an attitude of acceptance and respect towards individual differences (age, gender, physical and mental characteristics, etc.).
- Participate in group activities in a constructive, responsible and supportive manner, respecting the basic principles established.
- Adopt an attitude of respect and the evaluation of one's own contributions and those of others, according to common objectives.
- Promote situations of encounter, communication, knowledge and understanding of others, as a foundation for empathy, sympathy, mutual respect and solidarity.
- Develop an attitude of respect towards the characteristics and traits of other groups, valuing differences and rejecting any kind of discrimination.
- Observe and appreciate the value of different elements (cartographic, numeric, graphic, technical: museums, libraries, archives, etc.) of the historical, social, natural and cultural heritage of Spain, which represent and express facts, concepts, procedures and attitudes.
- Develop a communicative and critical attitude in the performance, assessment, exhibition and presentation of the work done, applying

one's own criteria of self-assessment and analysing its practical, entertainment and educational importance.

- Practise the basic qualities of scientific thinking: objectivity, reflection, planning, rigor, causality, etc.
- Analyse the impact of some human activities on the natural and social environment (urban landscape, agricultural landscape, alteration of river courses, dumping of waste, pollution, etc.), distinguishing between positive and negative actions.
- Adopt attitudes that contribute actively to the conservation and improvement of the environment and natural heritage.
- Value the efforts of those who dedicate themselves, altruistically, to the care and improvement of natural and cultural heritage.
- Identify the main elements of one's natural environment, analysing the most relevant characteristics.
- Identify some significant objects and technical resources of the environment, and describe their contribution to satisfying certain human needs, valuing their orientation towards peaceful uses and for a better quality of life.
- Understand and evaluate the usefulness of objects and technological resources in the life of human beings.
- Develop attitudes of appreciation and respect towards the objects and technological resources applied in daily life and which contribute to an improvement in the quality of life.
- Evaluate technological contributions from an ethical perspective, distinguishing between beneficial and harmful contributions.

## **Objectives in English as a Foreign Language for the third cycle of Primary Education**

- Understand and correctly represent the spoken commands and the written expressions being studied.

- Understand the general and specific information from short oral and written texts that refer to already known objects, situations and events.
- Use spoken English to communicate with the teacher and classmates in everyday school activities, paying attention to the rules of interpersonal communication.
- Show respect for their classmates' contributions in English class.
- Create correctly written texts about known topics, expressing their opinion about these and respecting the grammar rules that have been studied.
- Classify words into different categories.
- Read and understand short simple texts related to their own experiences and interests, which have previously been worked with orally.
- Read and understand their own written production.
- Read and understand the most habitual signs, notices and messages in their surroundings and in the media.
- Use new technologies to express themselves in English.
- Reflect on the use of non-verbal resources as tools to express themselves in English.
- Value the importance of communicating in a foreign language, and their own ability to learn it.
- Respect the customs and traditions of people from different cultures, showing an understanding and respectful attitude.
- Show interest in learning English as a foreign language, with a receptive and confident attitude about their own ability to learn.
- Remember what has already been learnt in other languages to learn and practise new expressions in English.
- Become aware of the importance of the resources used to learn other languages in order to apply them to the learning of the foreign language.

- Establish connections between the meaning, pronunciation and graphic representation of the new vocabulary, and learn how to use it in simple sentences, by recognising the sounds, rhythm and intonation of the English language.





# 3 Curriculum contents

## Contents of Science 5 (Year Five)

- Observable basic physical changes of material.
- Some machines and apparatuses frequently used in the environment: their main characteristics and basic rules for use.

## Contents of Science 6 (Year Six)

- Light. Light as a form of energy: light sources.
- The behaviour of light: reflection and refraction.
- The decomposition of light: colour.
- Some machines and apparatuses frequently used in the environment: their main characteristics and basic rules for use.



# 4 Methodology

## Introduction

The objective of the **PINCH OF SALT** Reading Plan is to present the reading of each book as a game focused on learning and the consolidation of the reading habit.

For this reason, we have included in this Teacher's Book a selection of materials designed to motivate pupils before, during and after reading. The materials included in the Book to make the most of this focus are as follows:

**Assessment work:** A complementary activity that will allow the pupils to consolidate the knowledge acquired via the reading of the book and to look in greater depth at some aspects related to it, at the same time as fostering the use of study techniques and information processing.

**Dramatic games:** A selection of entertaining activities based on the most recent teaching studies, designed to work on reading comprehension and support the acquisition of curriculum contents via the book.

**Vocabulary:** A photocopiable selection of terms that appear in the book, with clear and simple definitions, that can be used as a guide for the children during reading.

Some guidelines are provided below regarding how to approach reading, as well as on how to make the most of the complementary materials after reading the book. Teachers can adapt them to their teaching practice where they feel this to be necessary, since they are the ones who have the most knowledge of the educational requirements of their pupils.

## Before reading: Presentation of the book

Before starting to read *The Rainbow Party*, the teacher can ask the pupils about the difference between a lens and a mirror, and ask them to give examples from daily life of the use of lenses and mirrors. Items mentioned will include such things as glasses and contact lenses, rear-view mirrors, magnifying mirrors, and perhaps binoculars, telescopes, spyglasses, microscopes...

We could take some of these optical instruments such as, for example, a pair of binoculars, a magnifying glass and a mirror to class, and ask the pupils to describe what they are used for and how they work. Then we will allow them to try them.

Finally, we could ask the children whether they have ever seen a rainbow, and the circumstances in which they saw it. We can ask whether they have ever seen a miniature rainbow and how they think it was formed, and we will remind them of the colours that can be seen, for example, on the surface of soap bubbles (we could even make some bubbles in class so that the children can observe the colour effects).

In short, the idea is to find points of connection between the pupils' knowledge and the book that induce them to read it with enthusiasm and curiosity.

## During reading: Two possible alternatives

Once the teacher has prepared the pupils to immerse themselves in the book, it is time to begin reading it. There are two ways of approaching the reading, according to the time available and the educational use that the teacher wishes to give the text:

**Reading in the classroom:** The book can be read directly in class, using the sessions necessary for this. To encourage the pupils to acquire a habit of reading, the best way would be to combine three strategies during these sessions:

- Reading aloud by the pupils, to foster reading fluency and work on intonation.
- Listening of the audio CD.
- Silent reading.

During these sessions, teachers can interrupt the reading whenever they consider it necessary in order to comment on the story with the pupils, ask and answer questions on the text or make observations relating to it. This task can also be delegated to some of the pupils (a different group in each session). In addition, the photocopiable vocabulary included in this Teacher's Book may be used to work on those aspects of the Science curriculum that appear in the text and to resolve doubts regarding vocabulary.

**Individual reading at home:** After presenting the book in class, the teacher can recommend that the pupils read it as a complementary activity to be performed at home. This will encourage the habit of continued reading, the incorporation of reading in their leisure activities and individual responsibility. To support the pupils in this task, it would be ideal to give them the photocopiable vocabulary included at the end of this Teacher's Book, and to monitor the reading process on an individual basis by means of informal questions regarding the book. The students will be able to use the audio CD included in the book as a guide to overcome their pronunciation problems and to improve their intonation and comprehension skills.

A period of one month can be set to finish reading the book, after which some of the aspects covered in it can be worked on using the work cards.

Another alternative is to make the whole activity voluntary, and allow the pupils to choose which activities included in the teaching resources they prefer to do.

## After reading: Dramatic games and work cards

Whether the book is read in class or at home, once the pupils have finished reading, the teacher will organise a session of revision and assessment of the pupils' reading comprehension using for this the **dramatic games** offered among the resources of the Reading Plan.

Through these games, the pupils will be able to act out some of the situations that appear in the story and look more deeply at their meaning, exploring the curriculum contents tackled in the book in an entertaining and enjoyable manner, which will allow them to develop their creativity and use it as a support for learning.

After the session of **dramatic games**, teachers can hand out the **work cards** and use them as they consider appropriate to carry out compulsory and voluntary activities. In the following section, some indications are given regarding the use of these resources in and out of the classroom.



# 5 Using the work cards

Each title of the **PINCH OF SALT** series is accompanied by ten work cards with various activities that allow pupils to work on the contents of the book either in class or at home. Furthermore, each card includes information on the curriculum content, the competences and the types of activities that can be worked on and the skills to be practised. The activities are designed to cover a wide range of uses, and, according to the different uses, we have classified them as follows:

**Consolidation activities:** To consolidate curriculum contents and contribute to a better assimilation of these by the pupils. They can also be used as assessment activities and as revision activities for pupils who are not reaching the stage objectives.

**Extension activities:** To look at curriculum contents in greater depth, or to deal with the special needs of pupils who have already assimilated the basic curriculum contents.

**Complementary activities:** Extracurricular activities that are performed voluntarily, either at school or at home.

**After school activities:** Extracurricular activities that are performed outside school and which require monitoring by an adult.

**In group activities:** To form working groups and encourage collaboration and task distribution within the group.

**Interdisciplinary activities:** To allow the simultaneous handling of curriculum contents from two different areas.

**Activities for education in values:** Activities of a transversal nature which, based on the contents of a specific area, allow pupils to work on educational aspects related with the acquisition of healthy habits and attitudes of cooperation, integration and solidarity.

# Structure of the work cards

*Information on the competences and abilities to be worked on*

## 3 Stimulating creativity

1 Work in groups to make a **coloured spinning top**.

**Materials:**

Compass, thin white card, cardboard, ruler, pencil and felt tip pens.

**Procedure:**

- a) Using the compass draw two circles of the same size, one on the thin card and the other on the cardboard.
- b) Cut them out and divide the circle on the thin card into three segments: colour one in green, one in red and the other one in blue.
- c) Glue the two circles together and stick a pencil through the middle.

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**Contents**

Decomposition of light

Colours

**Activities**

Complementary: 1 and 2

Interdisciplinary with Art: 1 and 2

**Skills**

Speaking

Writing

*Information about the skills to be practised*

*Information on the method of use*

*Information on the content*

## Guidelines for using the work cards

The tables we present below provide at-a-glance information regarding the method of use of the work cards, indicating the types of activities, the competences and the contents that can be worked on with each one of the ten cards for the book.

<b>Summary of competences, contents and types of activities and English language skills</b>				
<b>Card Number</b>	<b>Competences</b>	<b>Contents</b>	<b>Activities</b>	<b>Skills</b>
<b>Card 1</b>	Observation Creativity	Propagation of light Reflection and refraction	1 and 2: consolidation 1: interdisciplinary with Art	1: writing 2: writing and speaking
<b>Card 2</b>	Understanding what you have read	Propagation of light Reflection and refraction Lenses and mirrors Colours	1 to 5: consolidation	1 and 2: reading, listening and writing 3 to 5: writing
<b>Card 3</b>	Stimulating creativity Observation	Decomposition of light Colours	1 and 2: complementary, interdisciplinary with Art	1: speaking 2: writing and speaking
<b>Card 4</b>	Experimenting Creativity	Propagation of light Reflection and refraction	1: extension 2: after school, interdisciplinary with Art	1: writing and speaking 2: writing
<b>Card 5</b>	Thinking and making connections	Lenses and mirrors Convergent and divergent lenses Decomposition of light	1 to 4: consolidation	1 to 4: writing



## Summary of competences, contents and types of activities and English language skills

Card Number	Competences	Contents	Activities	Skills
Card 6	Research Experimenting	Colours	1 and 2: complementary 2: interdisciplinary with Art	1: speaking 2: writing and speaking
Card 7	Applying what you have learned	Propagation of light Reflection and refraction Lenses and mirrors	1: consolidation 2: extension	1: reading and listening 2: reading and writing
Card 8	Observation Creativity	Shadows	1 to 3: extension 3: interdisciplinary with Art	1 to 3: writing
Card 9	Expressing yourself in writing Creativity	Decomposition of light Colours	1 and 2: extension, interdisciplinary with Language 2: interdisciplinary with Art	1 and 2: writing
Card 10	Understanding what you have read	Reflection and refraction Lenses and mirrors	1 and 2: extension 1: in group	1: reading, listening and speaking 2: writing

## Types of activities performed using the work cards

Interdisciplinary activities with Language	Card 9: activities 1 and 2
After school activities	Card 4: activity 2
Complementary activities	Card 3: activities 1 and 2
	Card 6: activities 1 and 2
In group activities	Card 10: activity 1
Interdisciplinary activities with Art	Card 1: activity 1
	Card 3: activities 1 and 2
	Card 4: activity 2
	Card 6: activity 2
	Card 8: activity 3
	Card 9: activity 2
Extension activities	Card 4: activity 1
	Card 7: activity 2
	Card 8: activities 1 to 3
	Card 9: activities 1 and 2
	Card 10: activities 1 and 2
Consolidation activities	Card 1: activities 1 and 2
	Card 2: activities 1 to 5
	Card 5: activities 1 to 4
	Card 7: activity 1

## Competences worked on using the work cards

<b>Experimenting</b>	Card 4: activities 1 and 2
	Card 6: activities 1 and 2
<b>Observation</b>	Card 1: activities 1 and 2
	Card 3: activity 2
	Card 8: activities 1 to 3
<b>Reading comprehension</b>	Card 2: activities 1 to 5
	Card 10: activities 1 and 2
<b>Written expression</b>	Card 9: activities 1 and 2
<b>Reasoning and relating concepts</b>	Card 5: activities 1 and 2
<b>Applying what has been learned</b>	Card 7: activities 1 and 2
<b>Creativity</b>	Card 1: activity 1
	Card 3: activities 1 and 2
	Card 4: activity 2
	Card 8: activity 3
	Card 9: activities 1 and 2

## Contents worked on using the work cards

<b>Reflection and refraction</b>	Card 1: activities 1 and 2
	Card 2: activities 3 and 4
	Card 4: activities 1 and 2
	Card 7: activities 1 and 2
	Card 10: activities 1 and 2
<b>Mirrors and lenses</b>	Card 2: activities 3 to 5
	Card 5: activities 1 to 4
	Card 7: activities 1 and 2
	Card 10: activity 2
<b>Propagation of light</b>	Card 1: activities 1 and 2
	Card 2: activities 1 to 5
	Card 4: activity 2
	Card 7: activity 1
<b>Convergent and divergent lenses</b>	Card 5: activities 1 to 4
<b>Colours</b>	Card 2: activities 1 to 5
	Card 3: activities 1 and 2
	Card 6: activities 1 and 2
	Card 9: activities 1 and 2
<b>Shadows</b>	Card 8: activities 1 to 3
<b>Decomposition of light</b>	Card 3: activities 1 and 2
	Card 5: activity 4
	Card 9: activities 1 and 2

## Solutions to “The PINCH OF SALT work cards” (The Rainbow Party)

**Card 1** **1:** The pencil looks as though it is broken due to the phenomenon of refraction, which is the deflection undergone by a ray of light when it passes from one medium to another.

**2: a)** Reflection.

**b)** It consists of the fact that rays of light rebound when they hit a specific surface.

**Card 2** **1:** He supposes that it is due to the existence of a kind of microscopic fairies who live in the clouds.

**2:** The rainbow is formed because the sun’s rays, when they pass through the drops of water in the clouds, which act as lenses, decompose into the seven colours that form white light, due to the phenomenon of refraction.

**3:** Distorting mirrors, shadow theatre, flat mirrors, prisms to form rainbows.

**4:** Prisms.

**5:** The prisms and some of the shadow puppets are transparent. The rest of the bodies used (mirrors, other puppets) are opaque.

**Card 3** **1:** Various answers.

**2: a)** The colours mix and the spinning top looks white.

**b)** The more colours we add the greyer the top looks because the colours lose purity.

**Card 4** **1: a)** Larger and longer than in reality.

**b)** Concave.

**c)** Smaller and squatter.

**d)** Concave mirrors.

**2: a)** The ray is not usually where you expect due to the phenomenon of reflection.

**b)** Various answers.

**Card 5** **1:** Due to the refraction of light, which deflects the rays when they pass through the lens.  
**2: a)** Thicker in the centre than at the edges.  
**b)** It is a convergent lens.  
**3:** The lenses of the glasses worn by short-sighted people are thicker at the edges than in the centre. They are divergent lenses.  
**4:** Because the prism refracts the sunlight, decomposing it into the seven colours that form it.

**Card 6** **1 and 2:** Various answers.

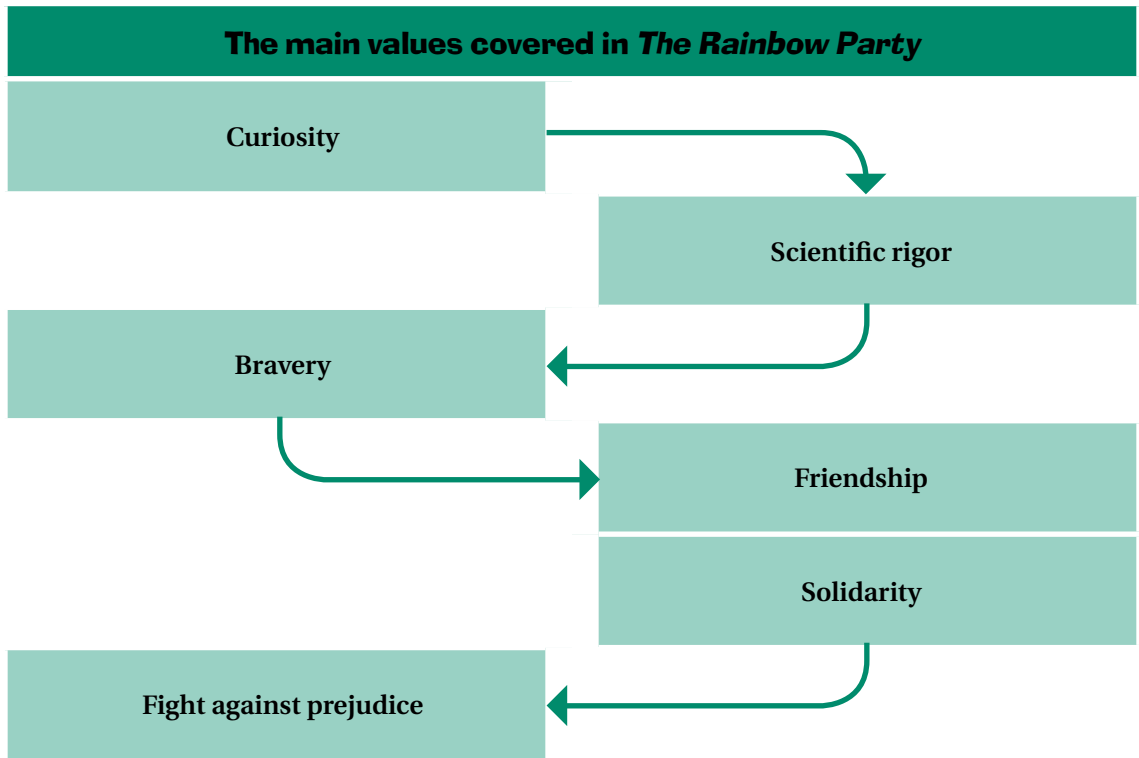
**Card 7** **1:** T F T F.  
**2: a)** The Sun.  
**b)** Because its surface is a reddish colour, which makes it absorb the different colours contained in sunlight except for red, which is reflected and which we see.

**Card 8** **1:** At midday the shadow is short.  
**2:** At the end of the afternoon the shadow is longer.  
**3:** At midday the sun is further away, so our bodies intercept less quantity of light and the shadow is shorter. At the end of the afternoon, the sun is on the horizon, closer to us, and therefore the quantity of light intercepted by our bodies is greater, so the shadow is longer.

**Card 9** **1 and 2:** Various answers.

**Card 10** **1:** Various answers.  
**2: a)** The suspect would begin to see the police officers on the other side because, although the mirror returns 90% of the light from the room, since the room is dark there is very little light, and it does not hinder the 10% of light that is filtered from the other side.  
**b)** The suspect would also see the police officers because, when the light on the other side of the mirror is switched on, much more light will be filtered to the interrogation room.

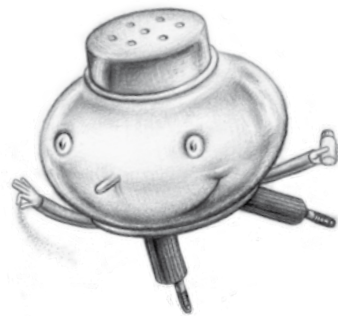
# 6 Values in the book







# A **Assessment work**



The aim is to assess the learning acquired in relation with the book through team work which will consist of holding a 'rainbow party' similar to the one held in the book.

**Objective:** To foster creativity and the acquisition of strategies for experimentation and the preparation of small devices based on the science of optics, as well as consolidating the knowledge acquired through reading ***The Rainbow Party***.

**Materials:** Gold and silver card, coloured cellophane, prisms, magnifying glasses, kaleidoscopes and other optical instruments, acetate sheets and card for making puppets, printers and paper for printing, scissors, glue, string, small sticks, etc.

## **Procedure:**

- 1) In the first session, the pupils will be divided into several teams of five members and each team will be assigned one of the following objectives (or others that the teacher considers relevant) either by drawing lots or at the teacher's discretion.
  - Mirrors: this team will have to create "attractions" based on the different properties of mirrors. They can bring different types of mirrors from home or they can be given some of those available at school. They can also create concave and convex mirrors with gold or silver card, or bring spoons, stainless steel ladles and other utensils from home with reflective concave or convex surfaces.
  - Lenses: this team will have to create attractions based on the properties of different types of lenses: They can bring magnifying glasses, old glasses, binoculars, spyglasses or telescopes from home. They can be given school material such as microscopes or telescopes if these are

available. They can be asked to visit an optician's that may be able to give them some discarded lenses for the work.

- Rainbows: this team will look for phenomena of decomposition of light, using prisms, plastic, water from a hose, soap bubbles, etc. They may also include photographs of rainbows.
- Shadows: this group will make a shadow theatre, experimenting with hand shadows and small puppets they make themselves with acetate sheets of different colours or opaque card.
- Colours: this group will experiment with primary and secondary colours, mixing colours, using different types of paint, coloured bulbs to see the effect of mixed lights with bulbs of various colours, colour schemes on the screens of smartphones, stained glass windows made with coloured cellophane, etc.

**2)** The teams will be given time to compile information, organise and prepare the materials that they are going to contribute to the party.

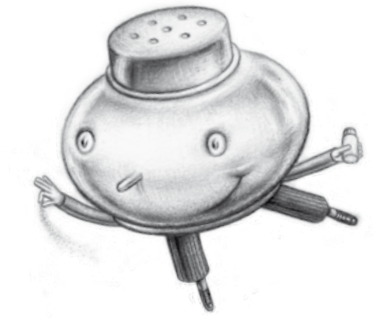
**3)** One session will be dedicated to preparing the party by all the groups.

**4)** Guided tours of the party will be prepared, in which one member of each group will present the materials that they have contributed.

**Assessment criteria:** For the assessment of the work, it is suggested that the following criteria should be taken into account:

- Efficiency in the organisation of the work and the fair distribution of tasks.
- Creativity.
- Capacity to transmit the knowledge acquired by means of the work performed and the oral presentation that accompanies it (during the guided tour).

# Dramatic games



These games have been designed to work on the contents of the book, while encouraging the pupils' creativity and imagination.

The first thing that the participants need to understand is that there are no "correct" or "incorrect" answers to the game. It uses an open approach where many different interpretations are possible, provided that the basic rules are respected. In this way the games not only serve as instruments for learning, but also contribute to developing the pupils' self-sufficiency with regard to the interpretation and application of rules, as well as their sense of responsibility with regard to applying them.

According to the most recent educational studies, this is, without any doubt, the most valuable contribution that the dramatic game makes to education: that of fostering self-control and the acquisition of values by interiorising a particular role within a defined game situation.

## Game 1: "From Occam to Earth"

### Materials required:

A magnifying glass, some glasses, a prism, a cellophane stained glass window, a spotlight for projecting shadows on the wall, a mirror, other objects related with optics or colour.

### Procedure:

- a) The pupils are divided into two groups: half will be citizens of Occam and the other half people from the Earth.
- b) The teacher will call in turn a member of the Occam group and another from the terrestrial team. He or she will give them one of the objects mentioned in the materials section and ask them to discuss it. The inhabitant of Occam must try to explain the properties of the object in magical terms, the terrestrial person in scientific terms.

### **Rules of the game:**

The role of the teacher is to coordinate the game and motivate the pupils.

The idea is for the pupils to play the role assigned to them and to enjoy the game at the same time as they revise the contents of the book. The teacher will set the maximum time for each representation, and will encourage the pupils in the audience to assess the positive aspects of each performance.

### **Objective:**

This exercise will allow pupils to consolidate the understanding of both the plot of the book and the curriculum contents playfully and creatively.

## **Game 2: “Shadow theatre”**

### **Materials required:**

Coloured acetate sheets, card, coloured cellophane, scissors, glue, string, sticks, a sheet of paper, an adjustable table lamp.

### **Procedure:**

- a)** The pupils are divided into groups of five.
- b)** The teacher will assign to each group one of the following scenes from the book (or others that he or she considers appropriate for the activity):
  - King Tristan discusses the rainbow with Enid and Bert.
  - Enid uses the magic lamp and everything disappears.
  - Thomas and Penelope arrive with their books and they organise the party.
  - The visit to the glazier to make the mirrors and the prisms.
  - Milena arrives at the party and spoils it.

- They are all looking at the stars with the telescope and Marc appears.
- Milena is expelled from the castle.

**c)** The children will prepare a shadow performance of the scene assigned to them. They can dress up and be the characters themselves (easier) or make puppets, but in both cases the performance will be given using shadows. It will be emphasised that the objective is not to play the scene literally, but to do so in a free and creative manner.

**d)** The different groups will take turns to go to the front and play their scene.

### Rules of game:

The teacher's role is to coordinate the game and motivate the pupils.

The children should express themselves in their own words and mix the preparation of the scene with improvisations that arise.

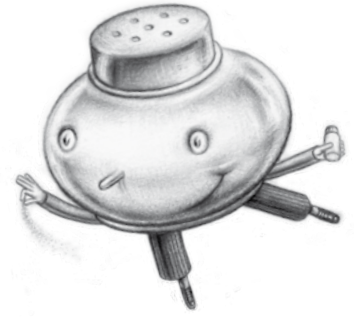
### Objective:

Revise the contents of the book in an entertaining way.





# Vocabulary



**Absorb:** Said of a body, to amortise or extinguish the radiations that go through it (including light).

Example: *Black absorbs all colours and does not reflect any of them.*

**Against the light:** View or appearance of things from the side opposite to the light.

Example: *As the man was sitting against the light, his face was hidden by shadows.*

**Alien:** A living creature from another planet other than the Earth.

Example: *If Martians existed they would be aliens.*

**Concave:** Said of a line or a surface that has a curved form that is deeper in the centre than at the edges.

Example: *I need a concave recipient.*

**Congress:** A conference, usually held on a regular basis, at which members of an association, body, organisation or profession meet to debate on previously decided matters.

Example: *The doctor is not here because he has gone to a congress in New York.*

**Convex:** Said of a line or a surface that has a curved form that is more raised in the centre than at the edges.

Example: *That hat has a convex shape.*

**Crater:** Hole or cavity, more or less circular, formed by a volcanic explosion or a falling meteorite.

Example: *The moon is full of craters formed by the impact of meteorites.*

**Dismiss:** To be expelled from a job or position.

Example: *After the mistake he made on television, the minister was dismissed.*

**Experiment:** Research procedure that consists of performing operations aimed at discovering, checking or demonstrating specific phenomena or scientific principles.

Example: *The experiment went wrong because the laboratory did not have the necessary equipment.*

**Flourish:** Feature or set of features of a specific form, traced after a name in a signature.

Example: *That's her signature, I can tell by the form of the flourish.*

**Improvise:** Do something on the spur of the moment, without studying or preparing for it.

Example: *That actor doesn't like learning his roles, he prefers to improvise.*

**Lens:** Transparent object used in optical instruments to deflect the trajectory of light rays and form images. They may be convergent (thicker in the middle than at the edges, they enlarge the image) or divergent (thinner in the middle than at the edges, they make the image smaller).

Example: *The lenses of this microscope are very good, they have a high resolution.*

**Opaque:** That does not allow light to pass through.

Example: *The mineral had lost its transparency and turned opaque.*

**Optics:** Science that studies the laws and phenomena of light.

Example: *When I grow up I want to study optics.*

**Parakeet:** A climbing bird from South America, similar to a parrot but smaller.

Example: *Peter taught his parakeet to talk.*



**Prism:** A glass object limited by triangular facets that is used to produce reflection, refraction and decomposition of light.

Example: *The light shone through the prism that was hanging from the ceiling, forming a rainbow.*

**Reflection:** Phenomenon that is produced when light hits a surface and rebounds from it.

Example: *Mirrors work thanks to the phenomenon of reflection of light.*

**Refraction:** The deflection undergone by rays of light when they pass from one medium to another.

Example: *A pencil in a glass of water looks broken due to the phenomenon of refraction.*

**Resignation:** An attitude that consists of accepting a certain situation and not trying to change it.

Example: *He accepted the dismissal with resignation and did not want to protest.*

**Short-sightedness:** A sight defect that makes objects appear blurred or unfocused.

Example: *He has to wear glasses because he is short-sighted.*

**Silhouette:** The form seen when looking at the mass of an object that is darker than the background against which it is projected.

Example: *At the entrance to the cave he could see a human silhouette.*

**Source:** Point of departure of a beam of light.

Example: *If the light source is further from the object, the shadows get smaller.*

**Switch:** Mechanism used to turn a lamp on or off or to activate or deactivate an electric circuit.

Example: *The room was dark and I couldn't find the light switch.*

**Telescope:** Optical instrument that allows us to see an enlarged image of a far-away object.

Example: *The telescope was perfected by an Italian astronomer named Galileo.*

**Test tube:** A glass tube, closed at one end, used for holding liquids or gases.

Example: *The laboratory is full of empty test tubes.*

**Thunderbolt:** A flash of lightning accompanied by a clap of thunder.

Example: *In ancient mythology many gods used thunderbolts as weapons.*

**Tripod:** Three-legged frame used for supporting optical or photographic instruments.

Example: *Put the camera on the tripod to make it more stable.*





**PINCH OF SALT**  
**A LITTLE BIT**

Add some flavour to your reading!

