

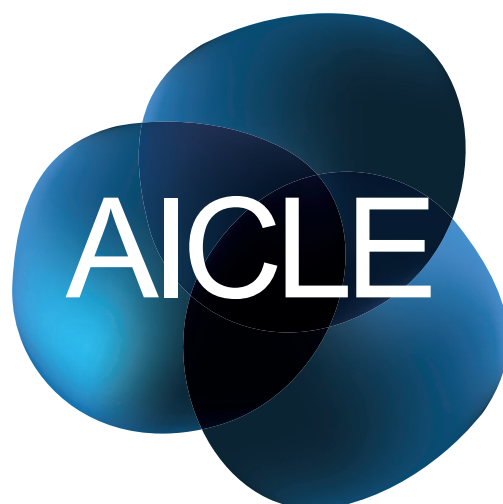
Matemáticas

Secundaria



JUNTA DE ANDALUCÍA

Inglés



Identificación del material AICLE

TÍTULO	Probability
NIVEL LINGÜÍSTICO SEGÚN MCER	A1-A2
IDIOMA	Inglés
ÁREA / MATERIA	Matemáticas
NÚCLEO TEMÁTICO	Probabilidad
GUIÓN TEMÁTICO	<ul style="list-style-type: none"> - Experimentos aleatorios y deterministas, espacio muestral, sucesos de un experimento - Tipos de sucesos: contrarios, incompatibles, equiprobables - Noción de probabilidad y regla de Laplace
FORMATO	Material didáctico en formato PDF
CORRESPONDENCIA CURRICULAR	2º de Educación Secundaria
AUTORÍA	Cristina López Lupiáñez
TEMPORALIZACIÓN APROXIMADA	6 sesiones
COMPETENCIAS BÁSICAS	<p>Competencia en comunicación lingüística</p> <ul style="list-style-type: none"> - Conocer, adquirir, ampliar y aplicar el vocabulario del tema - Ejercitar una lectura comprensiva de textos relacionados con el núcleo temático <p>Competencia Matemática</p> <ul style="list-style-type: none"> - Conocer las nociones básicas sobre probabilidad - Utilizar adecuadamente las estrategias del cálculo básico de probabilidades - Resolver situaciones utilizando las nociones matemáticas aprendidas <p>Aprender a aprender</p> <ul style="list-style-type: none"> - Aprender a relacionar los conceptos tratados - Organizar las nociones, ideas y argumentos de forma ordenada y constructiva. <p>Autonomía e iniciativa personal</p> <ul style="list-style-type: none"> - Ser autónomos para realizar las actividades individuales - Tener capacidad de juicio crítico ante opiniones ajenas - Expresar ideas propias de forma argumentada
OBSERVACIONES	Todas las actividades serán puestas en común y el profesor unificará conceptos y conclusiones. Los iconos sobre las destrezas comunicativas pueden guiar sobre el uso del material.

Tabla de programación AICLE

OBJETIVOS	<ul style="list-style-type: none"> - Reconocer y plantear situaciones susceptibles de ser formuladas en términos matemáticos, laborar y utilizar diferentes estrategias para abordarlas y analizar los resultados - Actuar ante los problemas que se plantean en la vida cotidiana de acuerdo con modos propios de la actividad matemática, tales como la exploración sistemática de alternativas, la precisión en el lenguaje, la flexibilidad para modificar el punto de vista o la perseverancia en la búsqueda de soluciones - Elaborar estrategias personales para el análisis de situaciones concretas y la identificación y resolución de problemas, utilizando distintos recursos e instrumentos y valorando la conveniencia de las estrategias utilizadas en función del análisis de los resultados y de su carácter exacto o aproximado 		
CONTENIDOS DE CURSO / CICLO	Estadística y probabilidad (Interpretación de fenómenos ambientales y sociales a través de las matemáticas)		
TEMA	<ul style="list-style-type: none"> - Tipos de experimentos: aleatorios y deterministas - Espacio muestral, sucesos. Suceso seguro y suceso imposible - Tipos de sucesos: Contrarios, incompatibles, equiprobables - Noción matemática de probabilidad. Ideas básicas relacionadas con la probabilidad - Regla de Laplace 		
MODELOS DISCURSIVOS	<ul style="list-style-type: none"> - Definir los conceptos básicos relacionados con la probabilidad - Realizar afirmaciones en términos de probabilidad respecto de un experimento/ suceso - Estimar la probabilidad de sucesos en situaciones determinadas - Discernir posibles nociones incorrectas preconcebidas sobre probabilidad - Calcular probabilidades usando la regla de Laplace 		
TAREAS	<ul style="list-style-type: none"> - Ejercicios para practicar el cálculo de probabilidades - Proyecto final o post-task: Invent a game 		
CONTENIDOS LINGÜÍSTICOS	FUNCIONES: <ul style="list-style-type: none"> - Redactar conclusiones. - Argumentar respuestas. - Exponer ejemplos, nociones e ideas. - Expresar acuerdo o desacuerdo con las ideas de otros. - Preguntar el porqué de ciertas afirmaciones. 	ESTRUCTURAS: <ul style="list-style-type: none"> My conclusion is... The main idea is... We have to consider... I think... because... It is true/false because... The probability of the event is... It is more/less probable than... That word means... For example... How do you calculate/ estimate/ define... this? I agree/ disagree with you because... Why do you think that? 	LÉXICO: <ul style="list-style-type: none"> Random / deterministic experiment. Sample space, outcome, event. Certain/ impossible event. Relative frequency (of an event). Probable, probability. Opposite/ incompatible/ equiprobable/ events. Laplace law.
CRITERIOS DE EVALUACIÓN	<ul style="list-style-type: none"> - Conocer el significado de los principales conceptos tratados. - Relacionar los conceptos para resolver situaciones prácticas y responder cuestiones sobre probabilidad. - Calcular probabilidades de ciertos sucesos. 		

BASIC IDEAS

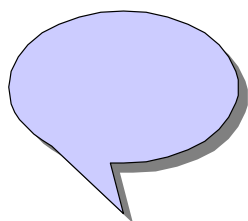
You will “probably” remember!

Let’s see...

Work with a partner.



1) Start!!



Talk about what these expressions mean with a partner.

- a) To be probable.
- b) To be more/less probable than (something).
- c) To be equally probable as (something).

Speaking help:

I think it means ..., for example ...



Think carefully about these two experiments:



Experiment A: You warm water up to 100°C.

Result: the water boils. Sure!

Experiment B: You close your eyes and choose one of your five best friends.

Result: one of your five friends but you don’t know who.

How are they similar? How are they different?

Speaking help:

I think they are very different because the first ... and the second experiment ...



Listening:



Fill in the gaps. Check your answers with a partner.



Imagine you warm _____ up to 100°C . You _____ what is going to _____: the water _____. And you can be _____ of it.

But if you cannot see your five best _____ at all (and you don't know where they are)... you _____ the _____ of your choice.

When you _____ the result of an experiment it is a _____ experiment.

When you know the _____ of an experiment, but you _____ which of them will occur, it is a _____ experiment.

Make a note in your vocabulary notebook:





DETERMINISTIC EXPERIMENT, RANDOM EXPERIMENT

Things can happen:



Classify these experiments and suggest possible results:



<p>You cool water down to 0°C.</p> 	<p>Classification: it is a</p> <p><input type="checkbox"/> <i>deterministic...</i></p> <p><input type="checkbox"/> <i>random...</i></p> <p>...experiment.</p>	<p>Possible results:</p>
<p>You toss a coin.</p> 	<p>Classification: it is a</p> <p><input type="checkbox"/> <i>deterministic...</i></p> <p><input type="checkbox"/> <i>random...</i></p> <p>...experiment.</p>	<p>Possible results:</p>
<p>You pick a card.</p> 	<p>Classification: it is a</p> <p><input type="checkbox"/> <i>deterministic...</i></p> <p><input type="checkbox"/> <i>random...</i></p> <p>...experiment.</p>	<p>Possible results:</p>
<p>You are vaccinated.</p> 	<p>Classification: it is a</p> <p><input type="checkbox"/> <i>deterministic...</i></p> <p><input type="checkbox"/> <i>random...</i></p> <p>...experiment.</p>	<p>Possible results:</p>



2) Rolling a die:



You win if you roll a die and obtain an odd number.





- a) Write the sample space of the experiment.
- b) Write the set of outcomes related to winning.
- c) Write the set of outcomes related to losing.
- d) Listen and complete the following text with the words below:

SET, RANDOM EXPERIMENT, OUTCOMES, **EVENT**,
SAMPLE SPACE, SUBSET

The _____ of the _____ of a _____ is called
_____.
An _____ is a _____ of the _____.

PROBABILITY IS...

What is probability?
Work in groups.



1) What is more likely to happen?

- a) Imagine you throw a die. If you had to bet on the outcome, which of the options below would you choose? Why?



Share your opinion with the rest of the class.

A: "3"

B: an odd number

C: "4 or 5"

D: a number greater than 5

I choose.../because the probability...

b) Set the four options in a) on the following line. Compare your answers.



Speaking help: The one represented more to the right has to be.../ The one represented in the middle has to be...



c) Work with a partner – discuss your answers.

If you toss a coin ten times:

- ☐ You cannot know what will happen.
- ☐ You will get "head" at least once.
- ☐ You will definitely get "head" five times.



Speaking help: I think the best option(s) is/are... because...



2) Work in groups. One of you will toss a coin (at least 20 times). Record your results:



head	tail



a) Calculate the percentage of times you obtain “head”, and the percentage for “tail”:

b) Compare your results with other groups.

c) What would happen if you repeated the experiment 900 times?

I think...

d) What can you say about the probability of obtaining “head”?
And about the probability of “tail”?

We can observe that...

Did you know?

When there are only two possible outcomes, the experiment is called a dichotomous experience.



If A is an event of the sample space of a random experiment and we repeat the experiment a certain number of times, the **relative frequency** of A is the number of times A occurs divided by the total number of times we repeat the experiment. Example: we toss a coin 900 times and we obtain “head” 420 times. The relative frequency of “obtaining head” is $\frac{420}{900} = 0,466$

$$\frac{420}{900}$$



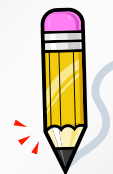
3) The coin.



- a) Calculate the relative frequency of “head (H)” in each case. Then, write a conclusion (and compare it with other students’ conclusions):

Results (num. of times)	Relative frequency
Total = 20 H = 7	
Total = 100 H = 40	
Total = 500 H = 229	
Total = 1500 H = 753	
Total = 6000 H = 2998	
Total = 100,000 H = 50,001	

Conclusion:



b) In groups.

Prepare a short presentation with the title PROBABILITY IS...



Speaking help:

Probability is... but it is not...

A random experiment is...

To calculate probabilities we...

4) True or False? Work with a partner.

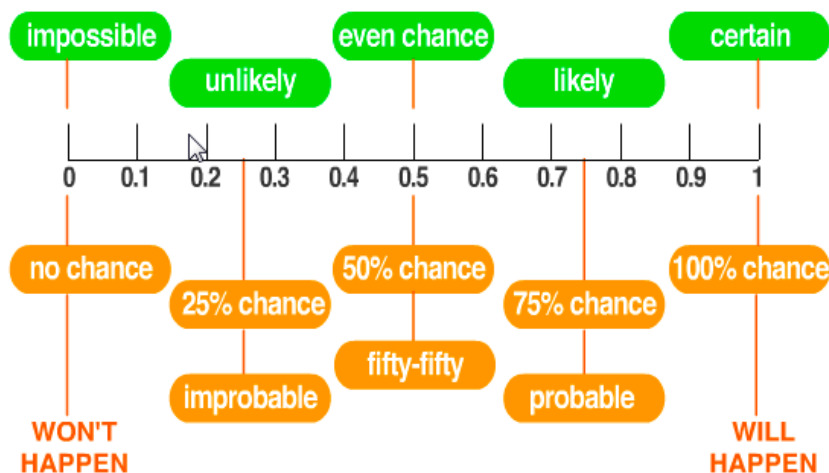
- a) The probability of an event is a **fraction**.
- b) The probability of an event is a **percentage**.
- c) The probability of an event can be calculated only for **random experiments**.
- d) The probability of an event is a **decimal** number.
- e) The probability of an event is **a fraction, a percentage or a decimal number**.
- f) The probability of an event can be **negative** (for very rare events).
- g) The probability of an event cannot be **higher than 100**.
- h) The probability of an event containing more than one outcome cannot be calculated.
- i) The probability of an event cannot be 0 (there's **always a chance**).



5) Listen and fill in the gaps. Then look at the graph, it will help you to understand.

The _____ of an event in a random _____ is the relation between _____ occurs and the number of times the _____ is repeated.

The _____ of an event gives _____ about "how likely the event is". Probability is _____ expressed by a _____.





If an event is SURE to occur, it is a **certain event**. It has a probability equal to 1.

If an **event** WILL NOT occur at all, in any case, it is an **impossible** event. It has a probability equal to 0.

MEASURING PROBABILITY

How can you measure how probable something is?

Let's find out...



Part I: Types of events

Not all sample spaces are the same, some of them can be really complicated and hard to analyze.

But in certain conditions the sample space can be easily described and studied, because the outcomes and events have special characteristics, we call these special events.

We will focus on those cases.



1) Will it / Won't it?



Estimate the probability of these events (in groups):

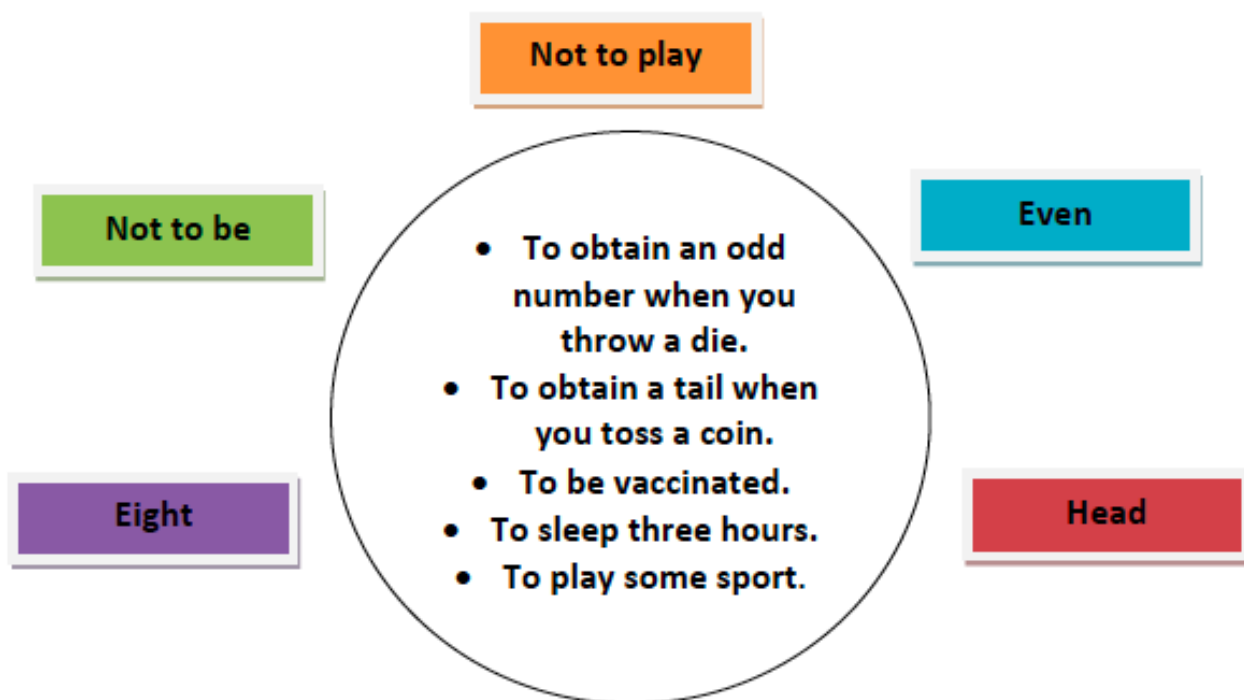
- Drinking water this week.
- Having a negative number of brothers or sisters.
- Winning 1.23 tickets for a concert.
- Visiting ten continents.
- Sleeping at least two hours this month.
- Seeing the rain once in your life if you live in La Coruña.
- Being born on the 35th of May.



Speaking help: I think the probability has to be more or less...

2) Opposite.

a) Match the boxes with the events in the circle. Which one is not an opposite?



b) Write three sentences describing three of the opposite events.



3) Bad friends.



Some things cannot occur at the same time. If you are eating at home, you cannot be eating at a restaurant at the same time... can you?



Complete the sentences with an event that cannot occur at the same time (an incompatible event):

- If the t-shirt is black...

- If you go to class...

- If you are studying...

- If you throw a die and you obtain 6...



4) Same probability:

Some sample spaces are specials because every outcome has an equal probability (they are equiprobable events).

Read these experiments and select in group the ones whose possible outcomes are equiprobable:

- To throw a die.
- To pick a card.
- To select a book in a library.
- To pick a ball.
- To select a cinema.
- To choose a color.



Speaking help: The ones with the same probability are...

Make notes in your vocabulary notebook:

OPPOSITE, INCOMPATIBLE, EQUIPROBABLE EVENTS

Part II: Calculating probabilities

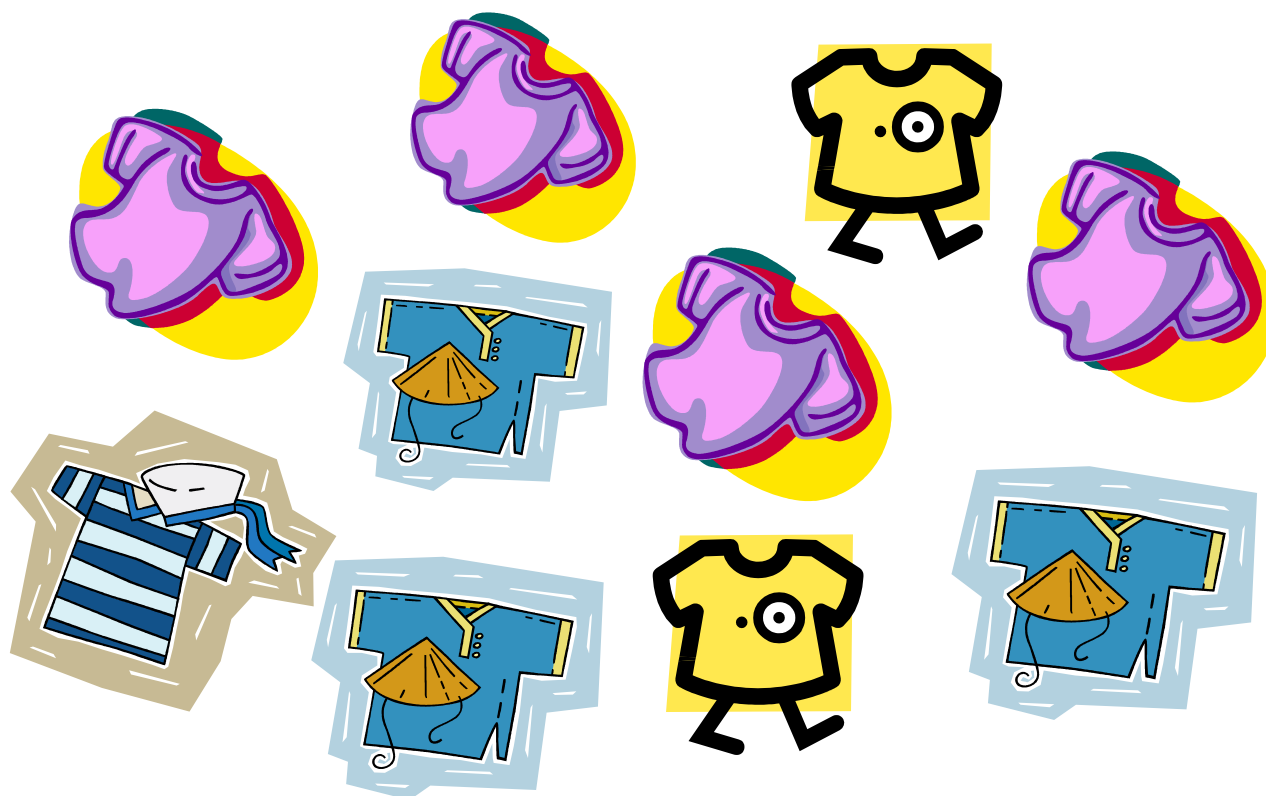
5) Listen and fill in the gaps:

As you _____ the _____ of an event of a sample _____ is a _____ number between 0 and 1 (_____). Imagine a _____ experiment with a _____ space where:

- ✓ There are _____ possible outcomes.
- ✓ Every outcome is _____.
- ✓ The outcomes are _____ events.

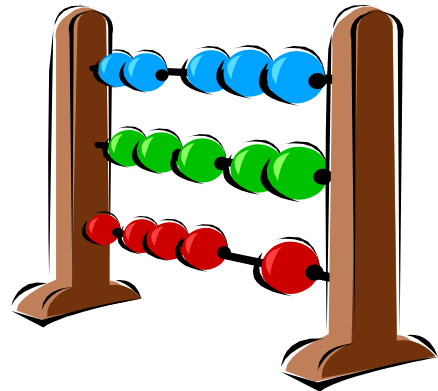
To calculate the _____ of an experiment in these conditions, we can use Laplace law.

6) Using what you don't know yet... Look at the following t-shirts:



a) Complete the information:

There are _____ blue t-shirts.
There are _____ yellow t-shirts.
There are _____ striped t-shirts.
There are _____ pink t-shirts.



b) Write a fraction to represent the proportion of each kind of t-shirt.



c) Calculate the probability of:

Wearing a striped t-shirt.
Not wearing a striped t-shirt.
Wearing a blue t-shirt.
Not wearing a yellow t-shirt.





If the sample space of a random experiment has a finite number of outcomes and the outcomes are independent and equiprobable, we can use Laplace law to calculate the probability of an event:

The probability of an event A can be calculated like this:

$$P(A) = \frac{\text{favourables outcomes}}{\text{possible outcomes}}$$



7) Practice: calculate the probability of:



- a) Obtaining a number higher than 4 when you throw a die _____
- b) Picking a seven in a Spanish pack of cards _____
- c) Choosing a prime number if you have balls with numbers from 1 to 15. _____
- d) Choosing a composite number in the previous situation _____



8) True or false? Why?



- The probability of two opposite events equals 1.



- The probability of two incompatible events equals 1.

- The probability of three equiprobable events cannot be the same for every event.



- If you know the probability of event A you need Laplace law to know the probability of the opposite of A.

Focus on vocabulary. Vocabulary game!

Work in groups. Each group will choose a speaker (the speaker will change every round of the game) to give the answer. Every group will prepare questions about vocabulary with the following possible structures:

- What does _____ mean?
- Can you give an example of _____?
- What is a _____?
- How do you say _____ in English/ Spanish?

The concepts to ask about are:

Random / deterministic experiment.
Sample space, outcome, event. Certain/ impossible event.
Relative frequency (of an event). Probable, probability.
Opposite/ incompatible/ equiprobable/ events.
Laplace law.

LET'S PLAY!



Invent a game:

With a partner you are going to invent a new game. You can use what you want. Follow the instructions. At the end, the whole class will vote on the best game... and you all will play it!!



1. Choose the theme of the game and the material you need to play. Use things everybody can find easily.
2. Establish the rules.
3. Write the possible outcomes (sample space) and some events related to the game.
4. And finally... calculate the probability of winning for each decision a player makes.



WHAT YOU HAVE LEARNT:

With this activities you have learnt...

That there are deterministic and random experiments.

That a random experiment has a sample space, the set of the possible answers.

That a subset of the sample space is called an event.

That there are certain and impossible events.

That there are different kinds of events:

- ✓ Opposite events.
- ✓ Incompatible events.
- ✓ Equiprobable events.

That the probability of an event is expressed in maths by a decimal number between 0 and 1 (inclusive).

That (in certain conditions) you can use Laplace law to calculate the probability of an event.

HOW WELL CAN YOU...?

Assess yourself



	ALWAYS	SOMETIMES	NEVER
CONCEPTS			
I understand and remember the concepts about probability that I studied.			
PRACTICE			
I can calculate probabilities by understanding situations and using Laplace law when it is necessary.			
LISTENING			
I understand when someone talks about probability.			
READING			
I can read texts about probability and understand the most important information.			
SPEAKING			
I can talk about key concepts related to probability.			