



Sequence 1: spatial structure of chemical species



Fiche de synthèse mobilisée (collection en français) :

- Fiche n°1 : structure spatiale des espèces chimiques



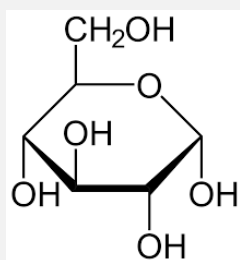
Sommaire des activités ETLV :

- ACTIVITY 1: Chirality in sugars

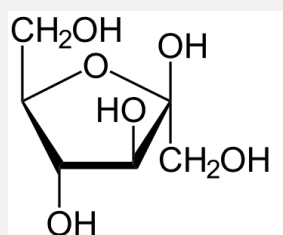
ACTIVITY 1: Chirality in sugars

Objective: understanding optical properties of chiral molecules

DOCUMENT 1: Representations of glucose and fructose



Glucose



Fructose

The intersections each symbolize a carbon atom.

Source: Wikimedia commons

DOCUMENT 2: Specific rotation of sugars

Sugar	Structure	Specific Rotation
Glucose a.k.a 'D-glucose' or 'dextrose'		+52.7°
Fructose a.k.a. 'levulose'		-92°

Source: Royal Society of Chemistry

**DOCUMENT 3: Materials for the experiment**

Polarising filters (at least one should be a minimum of 15 cm wide for best effect).

100 cm³ beakers

D-glucose

Fructose (available from supermarket sugar sections as 'fruit sugar')

A backing light consisting of an overhead projector or light box.

Source: Royal Society of Chemistry

DOCUMENT 4: Optical rotation of sugars

Watch video from 0-2'09s



<https://www.youtube.com/watch?v=GchTURvBz68&t=101s>

Source: Royal Society of Chemistry

■ Acquiring vocabulary:

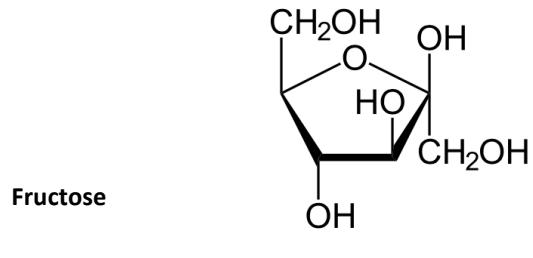
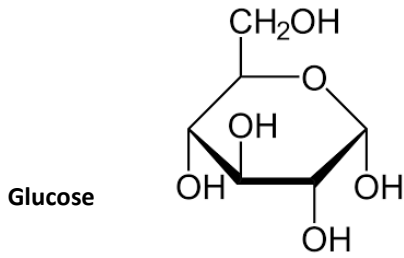
Using the previous documents, find a translation for the following expressions:

English	French
specific rotation	
chirality	
sugar	
polarising filter	
beaker	



■ **Reinvesting:**

Explain why fructose and glucose are chiral molecules. Mark the asymmetric carbon atoms with a *:



■ **Understanding:**

Watch the video in document 4 from 0-2'09s. Which physical property of chiral molecules is illustrated in the video?

What happens when the scientist rotates the polarising filter behind the two samples? Do both samples behave the same?

During the experiment where is the fructose sample located?



Activity summary

What you must remember:

- **specific rotation**
- **chirality**
- **sugar**

Skills linked to the curriculum:

Compétences	Capacités à maîtriser	Où dans cette séquence ?
APP	Utiliser du vocabulaire spécifique	Activité 1
	Lire et comprendre des documents scientifiques	Activité 1
ANA	Mettre en lien des documents pour émettre des hypothèses en réponse à une question scientifique	Activité 1
COM	S'exprimer à l'écrit en utilisant le vocabulaire adapté	Activité 1
REA	<ul style="list-style-type: none">• Repérer une molécule chirale.	Activité 1