



**centre de
développement
pédagogique**
*pour la formation générale
en science et technologie*



2011-05-25
Blue skin - black eyes



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ANIMATED PENGUIN FILE

June 2011

Your challenge:
Using your scientific and technical knowledge, you must carefully observe the main exhibit: a video sequence featuring the animated penguin.

With the help of your colleagues, you must imagine the mechanisms involved and the arrangement of these mechanisms.

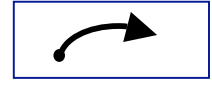
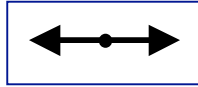
Investigators, get to work!

1. View the video sequence and note the movements observed on the images below.
2. As a team, imagine the mechanisms that would allow the production of the movements you have observed.
3. Represent your ideas.

Note for the animation:
A video is available in .MOV featuring sequences relate to this activity. The file name is:
pingouin_CDP.mov

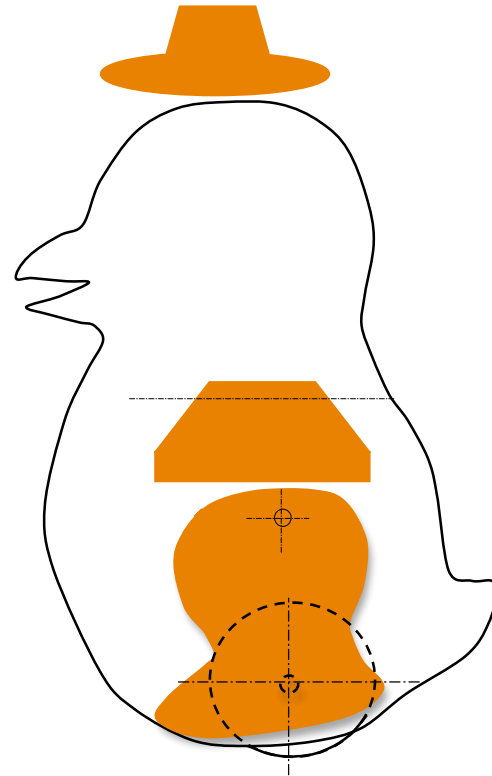
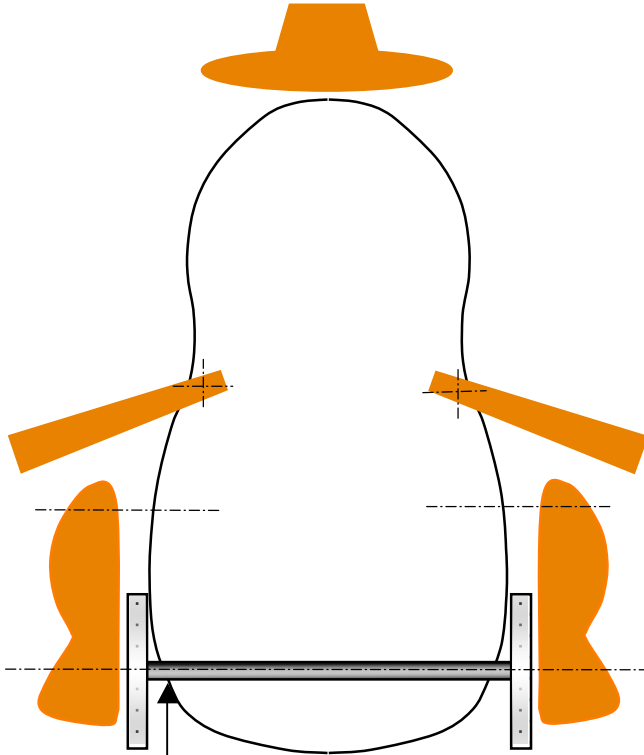


To guide the thinking...



The hat and the wings

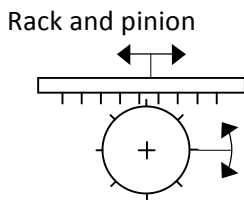
1. Indicate the movements of the hat, the wings, the legs and the axle on the diagrams below.



The axle is driven in rotation by a motor, not shown on the diagram.

3. transmission of movement. For each, indicate the movements observed and explain your answer.

a)

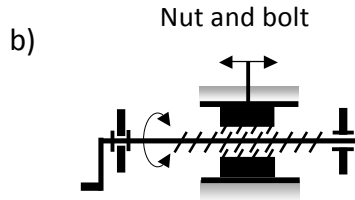


Yes, for what part? Explain your answer.

Note for the animation:
You will find demonstrators of mechanisms in Annex 3 of this document. Filmed sequences are also available for each of these demonstrators. They are also intended to provide examples of design solutions for the realization of the articulated model.

It is important to note that there are other demonstrators of mechanisms that are available in several schools.

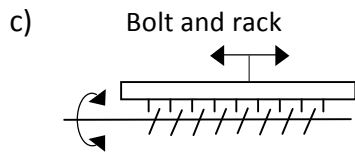
No. Explain your answer. *It is a transformation of motion (rotation to translation), but to get an oscillating translation, we would need to have a rotation that alternates from one direction to another. In the observed object, the wheels that drive the axle in rotation are always rotating in the same direction.*



Yes, for what part? Explain your answer.

No. Explain your answer.

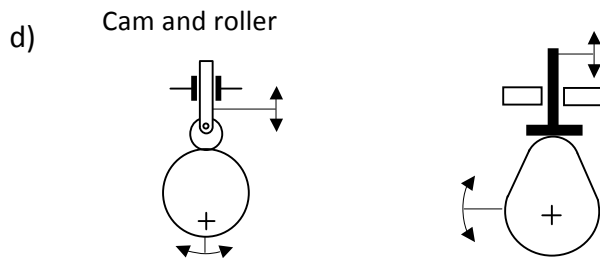
It is a transformation of motion (rotation to translation), but to get an oscillating translation, we would need to have a rotation that alternates from one direction to another. In the observed object, the wheels that drive the axle in rotation are always rotating in the same direction. In addition, we can see that the movement of the cap and the axle would have the right layout with this arrangement.



Yes, for what part? Explain your answer.

No. Explain your answer.

It is a transformation of motion (rotation to translation), but to get an oscillating translation, we would need to have a rotation that alternates from one direction to another. In the observed object, the wheels that drive the axle in rotation are always rotating in the same direction. In addition, we can see that the movement of the cap and the axle would have the right layout with this arrangement.

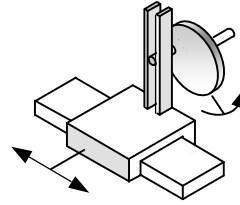
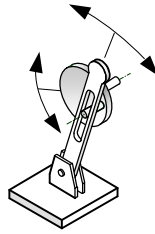
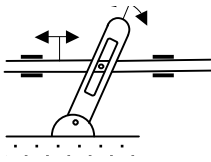


Yes, for what part? Explain your answer.

For the rotation of the axle and creating a translation of the cap. This is a transformation of movement (translation to rotation) and the continued rotation causes an oscillating translation motion. The cap can be connected to the "roller" section.

No. Explain your answer.

e) Crank and slide



Yes, for what part? Explain your answer.

The first model may be useful for movement of the wing. It shows that a translation is transformed into a partial rotation. One could imagine that the movement of the hat is passed to the wing that is attached to a pivot to transform the translation into a partial rotation.

We could also imagine that the second model would be useful to generate the movement of partial rotation observed on the legs. Indeed, it is noted that the crank fixed to the wheels in full rotation transmits a partial rotational movement to the rod fixed with a pivot.

No. Explain your answer.

You're now ready to build your articulated model using the equipment and materials provided.

4. Explain the working of your model using appropriate terms. We offer a library of words to use, if necessary, in your explanation.

Guiding in translation

Guiding in rotation

Free for rotation

Free for translation

Linked for rotation

Linked for translation

Partial rotation

Transmission of movement

Transformation of movement

Motion part

Receptor part (driven part)

Clearance between the parts