

BATMAN BEGINS

**1. Here is the beginning of a research article in physics.
Match the figures and their description.**

2. Come up with your own title for the article.

**3. What is the article about?
Write your own abstract in a couple of sentences.**

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A2_9 Trajectory of a falling Batman

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Abstract

The film *Batman Begins* shows the character of Batman gliding using a rigid form of his cape. This paper assesses the feasibility of such a glide and finds that while a reasonable distance could be travelled if gliding from a tall building, the speed at which Batman would be travelling would be too dangerous to stop without some method of slowing down.



Fig. 2: Batman gliding at a constant angle with respect to his direction of travel.



Fig. 3: A frame from *Batman Begins* [1] showing the area of Batman's cape during flight. The area of the cape is approximated using a triangle of height half that of Batman. Given that the height of Batman is $6'2'' \approx 1.88\text{ m}$ [5], the height of the triangle is then 0.94 m , and by comparing the lengths of the lines the base is 4.69 m . The area of the triangle is then 2.20 m^2 .

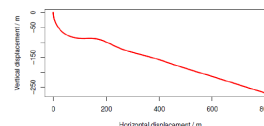


Fig. 4: Plot of Batman's position as he glides.

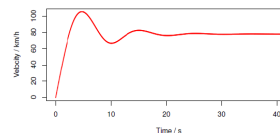


Fig. 5: Velocity profile of Batman's glide.

4. Now read the text and say if the sentences are right or wrong.

- A batcape is safer than a parachute. **Wrong**
- Batman's cape is as tall as he is. **Wrong**
- Batman could glide for 350 metres from a 150-metre high jump site. **Right**
- Batman glides too slowly so he can easily be killed. **Wrong**
- The wingspan of Batman's cape is too short to be able to fly well. **Right**
- The danger for Batman comes from hitting a car. **Wrong**

5. Find in the text, and in that particular order, the words corresponding to the following definitions.

- Fly without power: **to glide**
- Upward force exerted by the air on an aerofoil or other structure, counteracting gravity: **lift**
- The longitudinal retarding force exerted by air or other fluid surrounding a moving object: **drag**
- The extent or measurement of a surface: **area**
- A graph showing the relation between two variables: **plot**

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6. Think about similar scientific questions you could ask about icons from pop culture or fictional characters.

7. Discuss with your partner.

Which super power would you want and why?

Super power	How useful?	What would you do with this power?
Ability to fly		
X-ray vision		
Read minds		
Turn into anything		
Superhuman strength		
Hypnosis		

8. Grammar exercise.

Let's pay attention to the expression of movement in English.

Ex.: "A current is passed through it." (> traverser)

"Batman can glide to a distance of about 350m." (> parcourir en vol plané)

Traduction du mouvement

La tendance de l'anglais à concrétiser et à clarifier ce que le français décrit de façon plus abstraite a pour conséquence un très large choix de verbes exprimant une façon de se déplacer. L'anglais dispose par ailleurs de particules adverbiales qui permettent de renforcer ou de préciser le mouvement décrit par le verbe. Il est donc essentiel en thème de :

– choisir le **verbe exact** qui convient ;

Il remua l'index en ma direction. *He wiggled his finger at me.*

– penser à **ajouter un verbe de mouvement / position** dans certaines phrases ;

Elle attendait à l'arrêt de bus. *She stood waiting at the bus stop.*

Il descendit la route en courant. *He came running down the road.*

Les femmes tricotaient au salon. *The women sat knitting in the sitting room.*

– penser à utiliser des **particules adverbiales**, qui sont essentielles en anglais pour décrire un mouvement.

Lorsqu'on traduit, il est alors nécessaire, dans la plupart des cas, d'effectuer un chassé-croisé c'est-à-dire une double transposition.

Il sortit du pub en titubant.

He staggered out of the pub.

She shuffled along, leaning on her walking stick.

Elle avançait d'un pas traînant, appuyée sur sa canne.

Adapté depuis In So Many Words de Françoise Grellet

Translate the following sentences paying particular attention to the choice of the verb.

1. Il but d'un trait le café brûlant. *He gulped down the scalding coffee.*

2. Il se baissa et attrapa le journal. *He bent down and picked up the newspaper.*

3. D'un geste de la main, il fit tomber dans la corbeille tous les papiers qui se trouvaient sur le bureau. *He swept all the papers off the desk and down into the wastepaper basket.*