

# **Teaching Physics in isiZulu**

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# Context

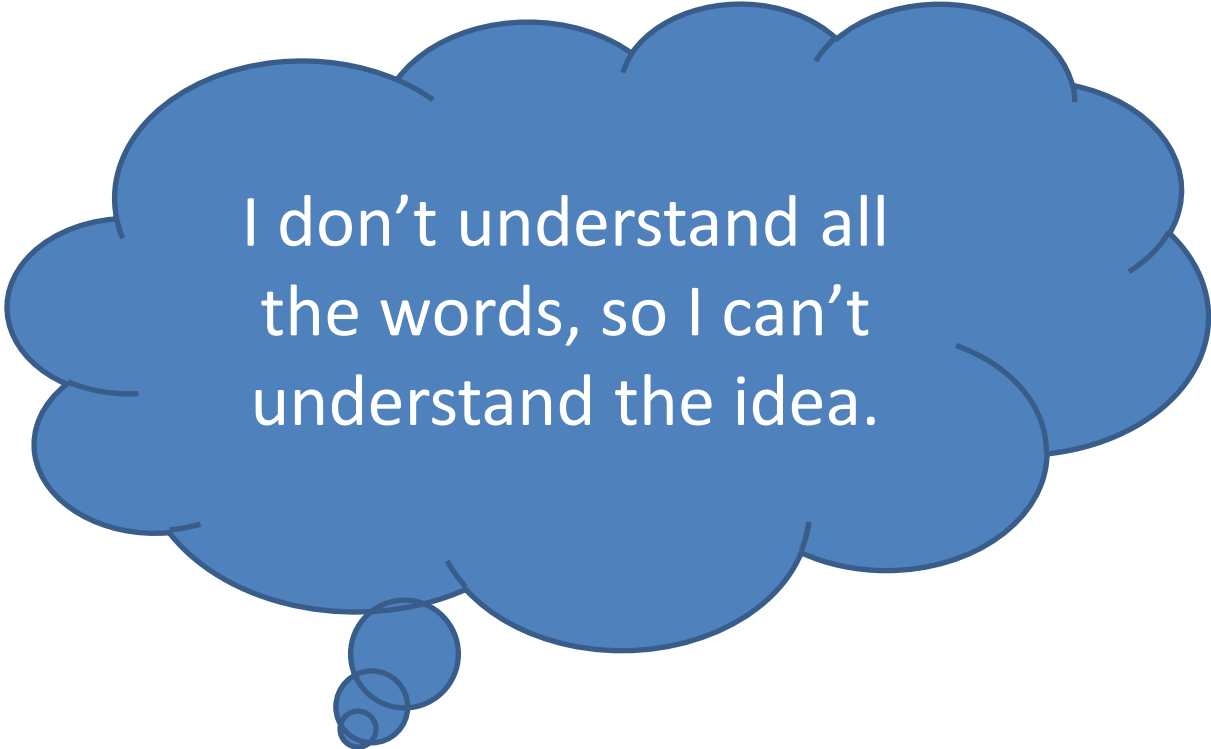
- Project funded by UKZN Language Board
  - Physics text: isiZulu and English side-by-side
1. Survey of student attitudes
  2. Terminology development
  3. Translation of English into isiZulu

**Assistance:** Justice Msomi, Wendy Dlamini, Sakhile Gumede

isiZulu

**English only**

The ινχλινεδ πλανε is a  
χομμον εξαμπλε in  
physics.

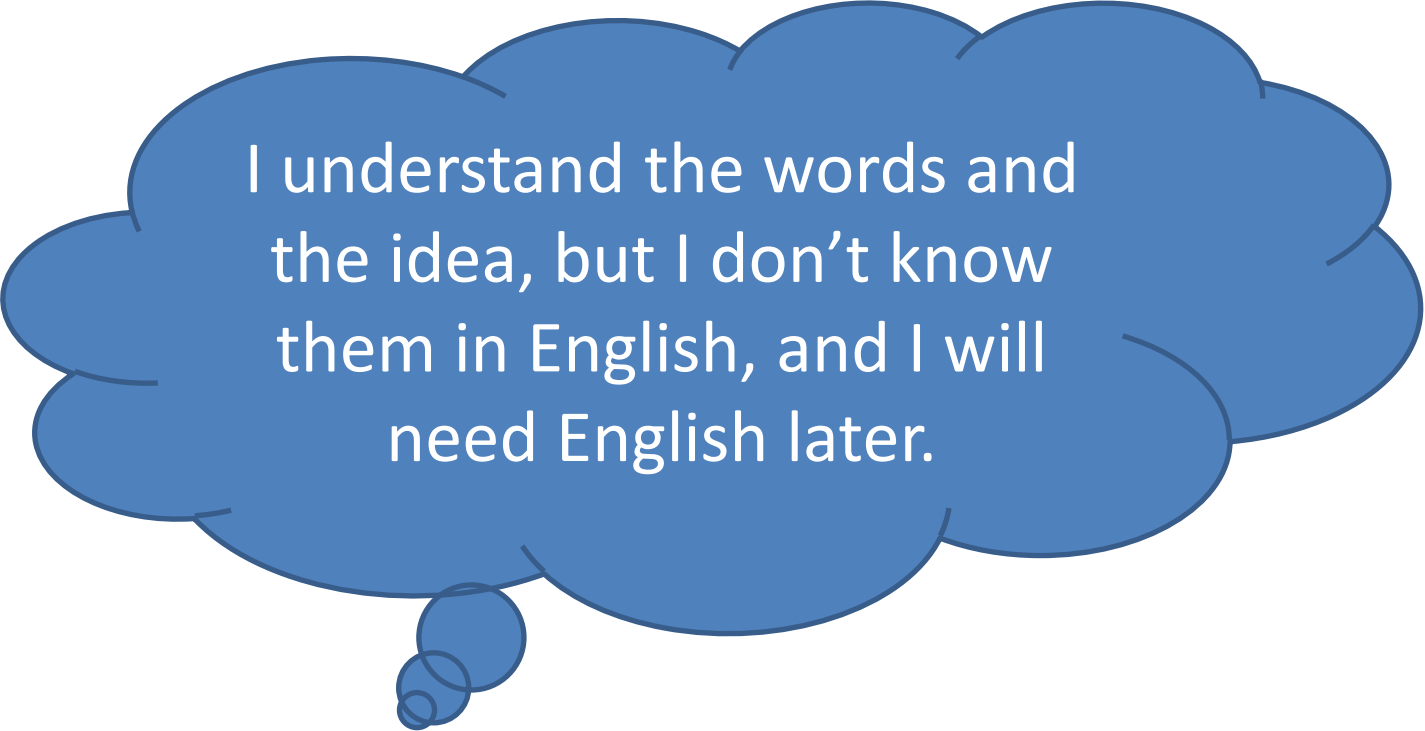


I don't understand all  
the words, so I can't  
understand the idea.

## isiZulu only

Ipleni egedlile iyisibonelo  
esejwayelekile kwifiziksi.

English



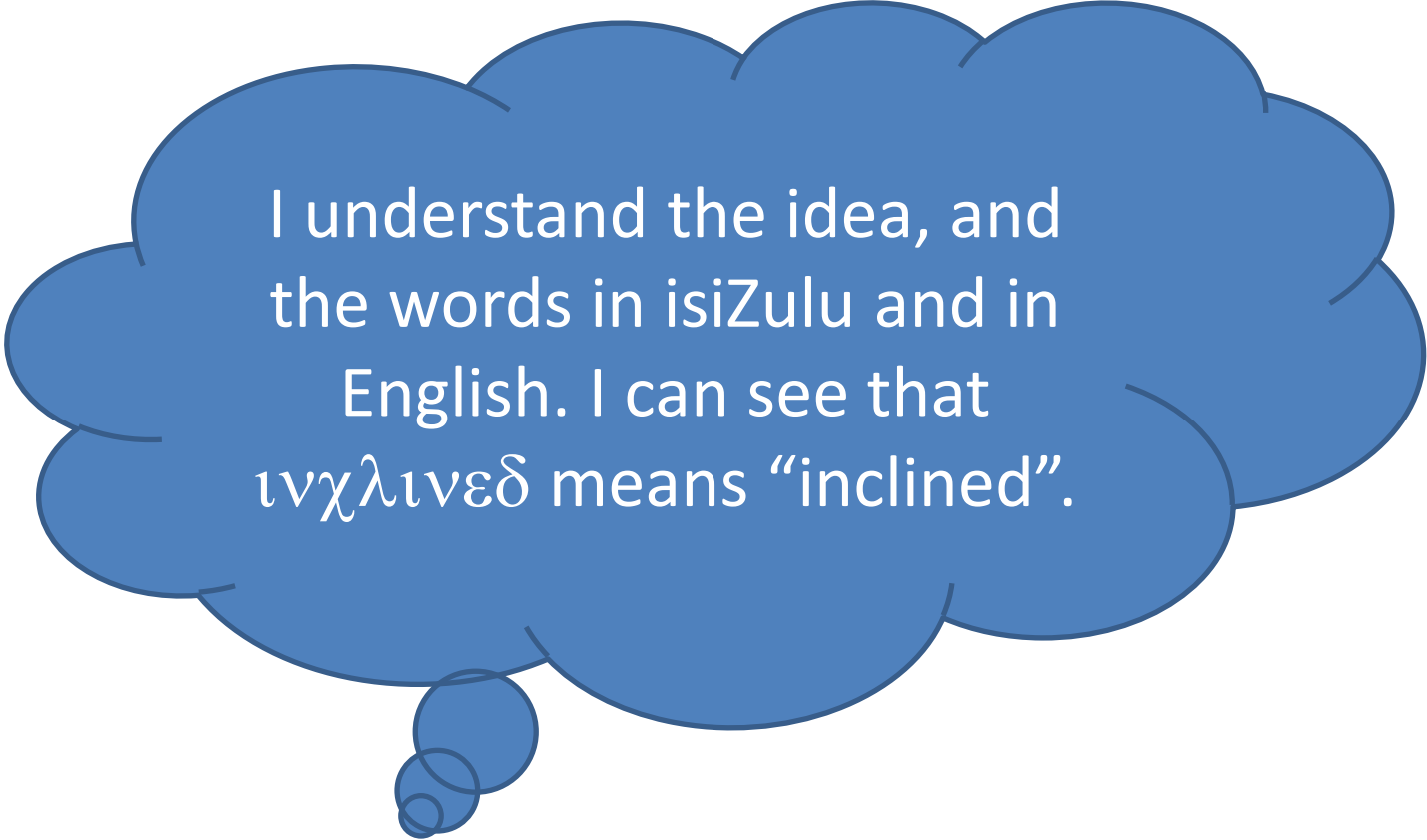
I understand the words and  
the idea, but I don't know  
them in English, and I will  
need English later.

## isiZulu

The inclined plane is a common example in physics.

## English

The *ινχλινεδ* *πλανε* is a *χομμον* *εξαμπλε* in physics.

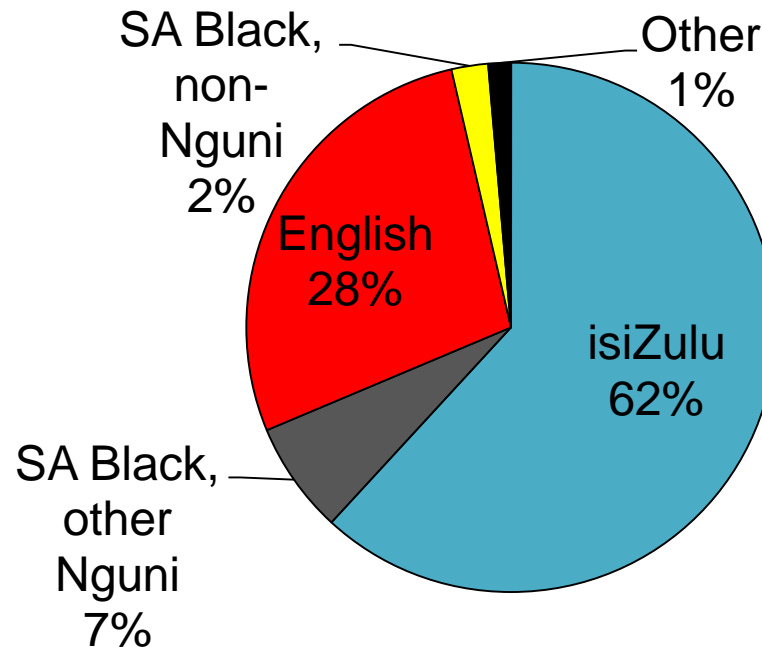


I understand the idea, and the words in isiZulu and in English. I can see that *ινχλινεδ* means “inclined”.

# Survey of Student Attitudes

- Feb 2013, First Year general physics class
- 944 students in class, 646 responses (68%)

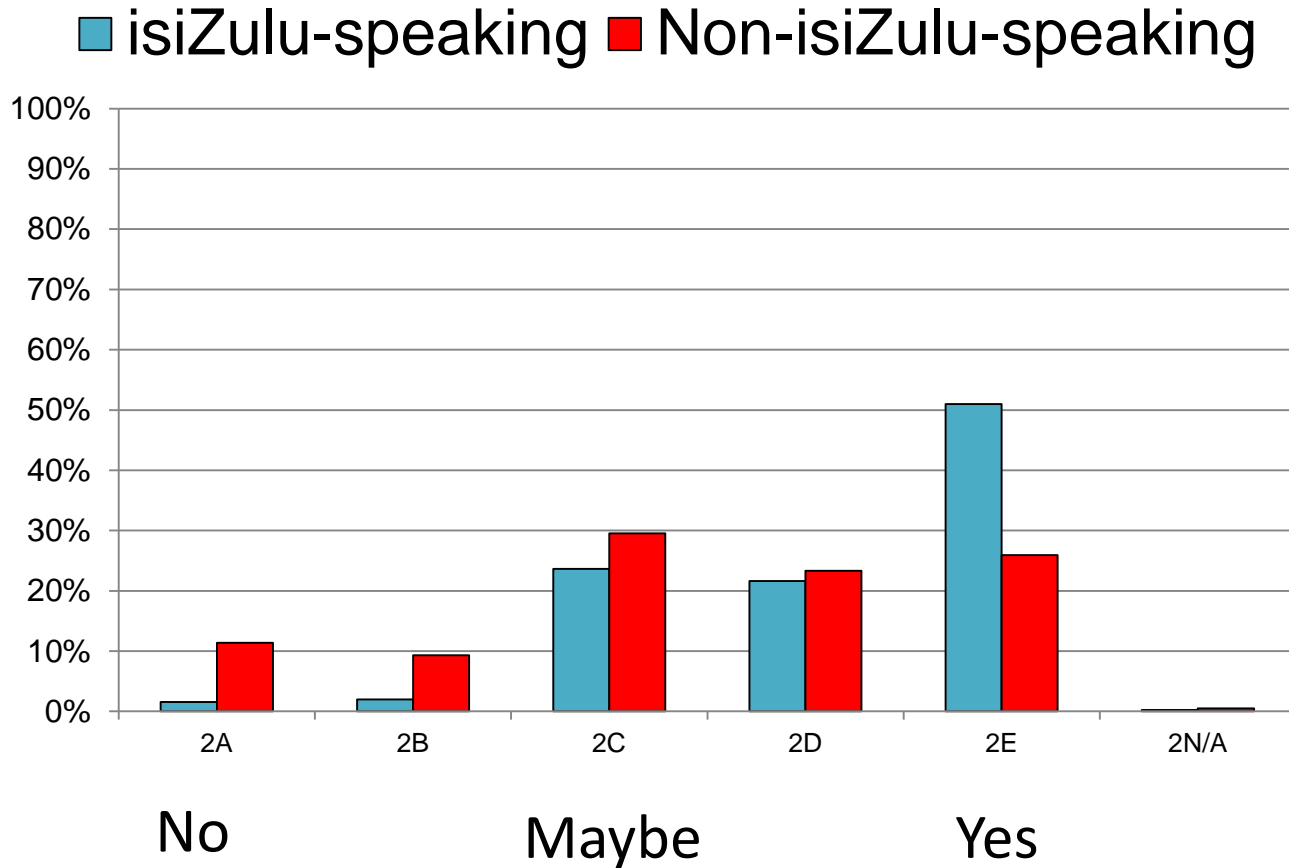
## Language distribution



# Attitude to attending isiZulu Tutorials

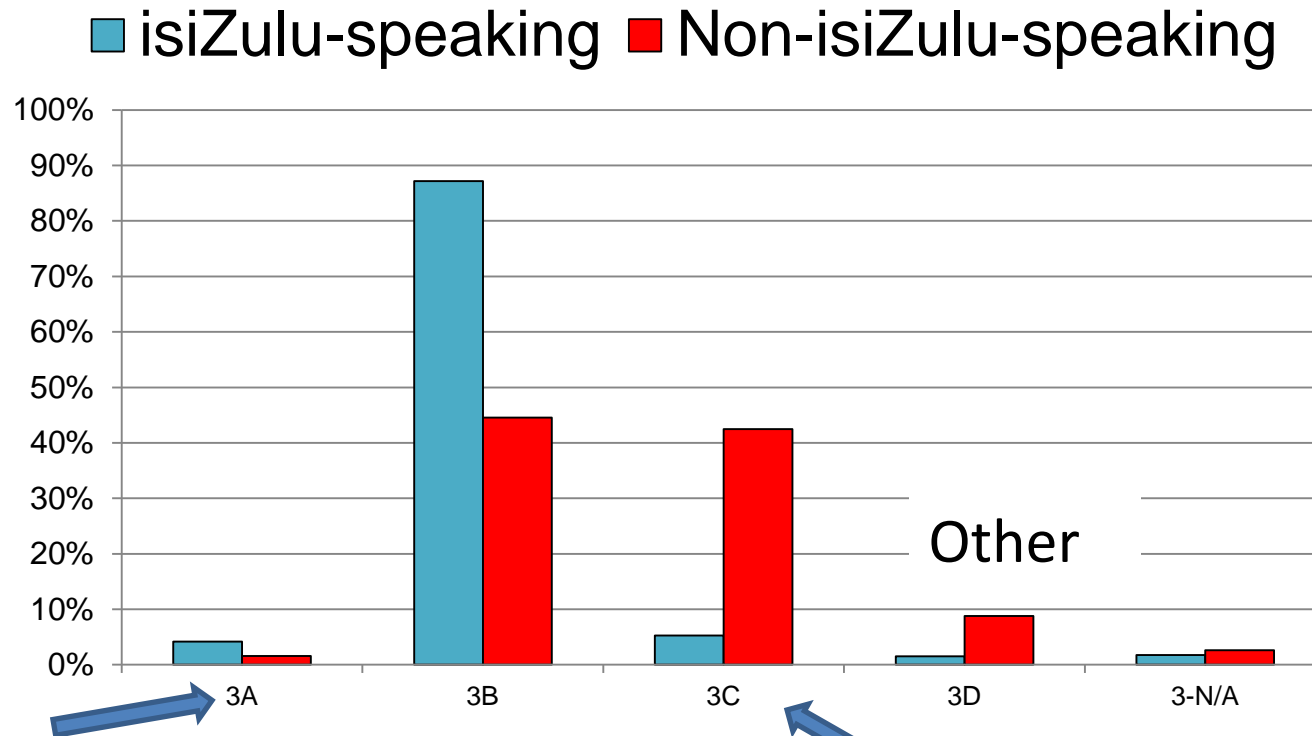
- 85% of isiZulu-speakers wish to attend isiZulu tutorials
  - This is a large number that requires organisation and resources

# Do you think that attending some physics tutorials in isiZulu will help a student who is an isiZulu speaker (with English as second language)?





# Feasibility of teaching physics in isiZulu



It is possible for Physics to be taught only in isiZulu

Physics can be taught partly in isiZulu, but some English is necessary

Physics cannot be taught in isiZulu

# Comments by isiZulu-speaking students

- What about those who don't understand isiZulu?
- Physics can be taught in isiZulu but exams are in English so I suggest partly of both.
- I would probably be able to learn physics in isiZulu but would prefer to write or answer questions in English.
- It might help students understand some concepts.
- It takes long to define something in isiZulu.
- Physics cannot be taught in isiZulu, it can be too complicated and highly ununderstandable. English makes it easy to understand. I guess that is the reason why it was chosen as a median language.

# Comments by Non-isiZulu-speaking students

- I honestly think it will confuse fellow students and physics has many terms that can't be translated to isiZulu.
- Excellent idea!!
- Physics is a twisted subject and needs to be explained in greater detail in English.
- Physics should be taught in English only for all to understand.
- I feel that physics lectures should not be taught in isiZulu, as isiZulu is not a universal language as English is.
- You will never know unless you try.

# Comment

“Teaching physics in Zulu is definitely a good idea and will help us a lot especially us who have isiZulu as our home language as we would be given an opportunity to understand physics better (in our mother tongue)! Thank you very much for this wonderful idea. We will benefit massively. Thank you!”

# Terminology

- Indigenous vs borrowed words
- Short words
- Not definitions
- Clue in word?
- Precise meaning
- One-to-one equivalents
- Use Greek roots, minus English modifiers
- Use isiZulu structure

# Candidate Terms

English	isiZulu	Notes
physics	ifiziksi	Naturalised Greek with Eng pron.
energy	ineji	Naturalised Greek
kinetic energy	inejikhinete	Suffix 'khinete' minus Eng suffix 'ic'
internal energy	inejiphakathi	Nat. Gk + isiZulu
velocity	ivelosi	Gk 'veloc-', minus Eng suffix 'ity'
accelerate	khesela	Gk 'ac'-> khe + 'celer'-> sela
physical object	ifizinto	fiz + into (does not exist in Eng)
vector	ivekha	Naturalised Latin (vehere, G. <i>weg</i> )
force	ifosi	Naturalised Latin
magnitude	imaginidi	Naturalised Latin, shortened

(isiZulu translation by  
Sakhile Gumede)

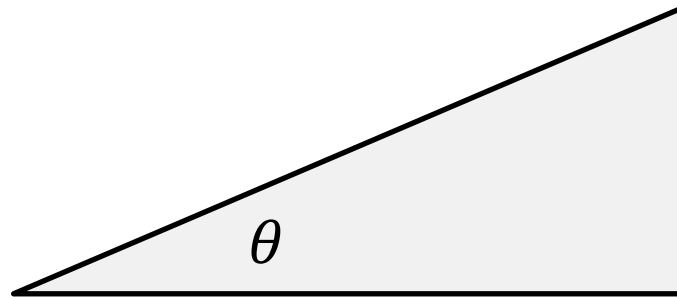
**Isibonelo sefosi:**  
**Ipleni Egedlile**

Ipleni egedlile iyisibonelo  
esejwayelekile kwifiziksi.  
Ipleni egedlile **isefesi** eqondile  
enomqansa.

(English text by  
Alan Matthews)

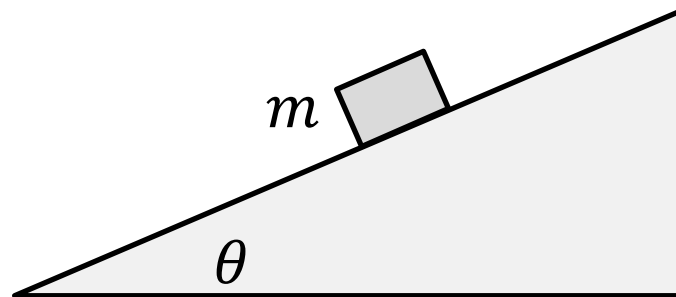
**Force example:**  
**Inclined Plane**

The inclined plane is a  
common example in **physics**.  
An inclined plane is a flat  
**surface** with a slope.



Isehlakalo esilula ilesi se**fizinto** enebunzima u- $m$  eshushuluza ibheke phansi eplenini. Asithi kunokugudla**khinete** phakathi kwale fizinto neselesi.

A simple situation is that of an **object** of mass  $m$  that slides down the plane. Suppose that there is **kinetic** friction between the object and the surface.





Ukuthola ukuthi le fizinto ihamba kanjani, sibheka **amafosi** asebenza kuyo, sihlanganisa lawa mafosi ukuthola **ivekhamphumela**, bese sisebenzisa uMthetho ka*Newton* Wesibili ukuthola **ukukhesela**. Sibe sesisebenzisa izibalokhinite ukuthola **ivelosi** ne**bangavekha**.

To find out how the object moves, we look at the **forces** acting on the object, we add these forces to find the **resultant**, and we apply Newton's Second Law to find the **acceleration**. Then we use **kinetic** equations to find **velocity** and **displacement**.

