



# HEDY

Textual programming made easy!

Femke Weijsenfeld – FOSDEM 2026



# TEXTUAL PROGRAMMING

# Python error messages



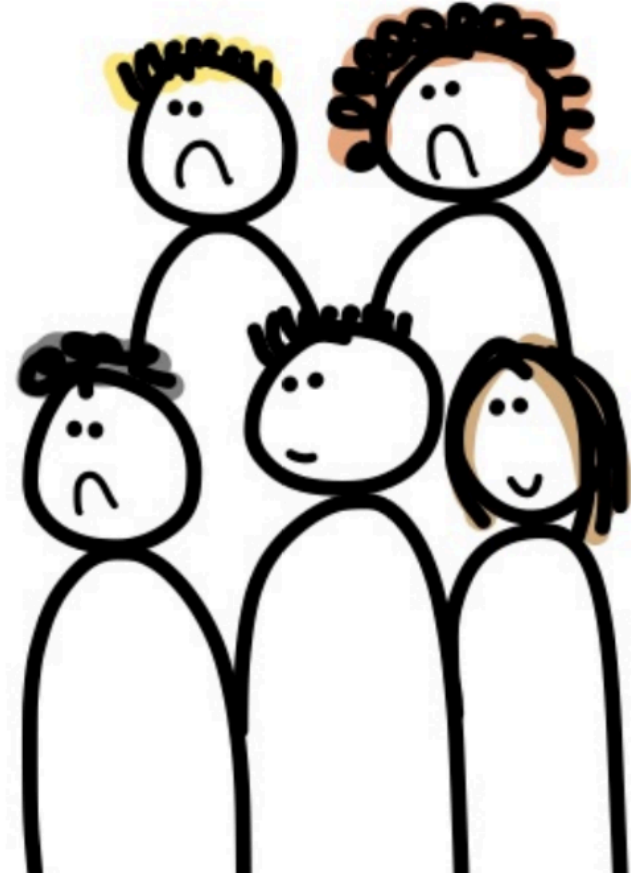
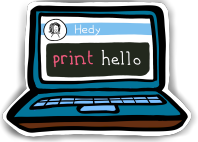
SyntaxError: unterminated string literal (detected at line 1)

IndentationError: unexpected indent

UnboundLocalError: local variable 'x' referenced before assignment

TypeError: 'NoneType' object is not subscriptable

# Python error messages





# TEXTUAL PROGRAMMING MADE EASY

# Meet Hedy!



- ▶ Hedy is a turing complete language
- ▶ Including teacher interface
- ▶ Available in the browser

The screenshot shows the Hedy web interface. At the top, there's a navigation bar with 'Home' and 'Hedy' links, a language selector set to 'English', and a 'Log in' button. Below this is a section titled 'Level 9 — draw it!'. Underneath, there's an 'Exercise' section with the instruction 'Recreate the drawings with the turtle!'. An 'Extra' challenge is also present: 'The number in brackets indicates in how many lines of code this figure can be drawn. Can you do it in the same amount of lines?'. Three target drawings are shown: a 'Square (3)', a 'Randomly colored star (5)', and a 'Randomly colored spiral (7)'. Below these, a code editor contains the following code:

```
1 colors is red, green, blue, yellow, purple, pink
2 repeat 5 times
3   color colors at random
4   forward 100
5   turn 145
```

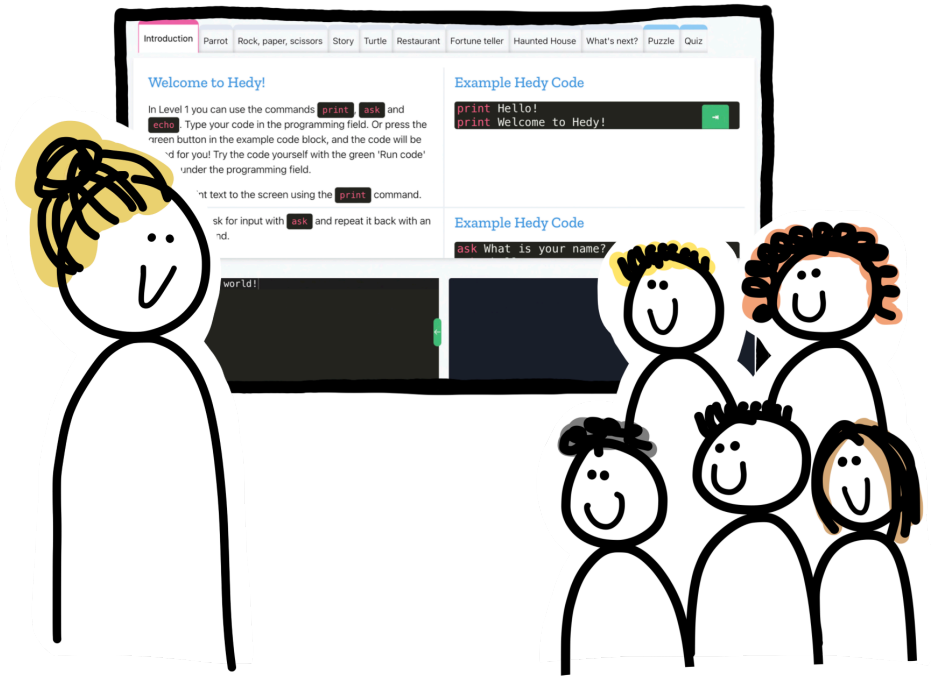
At the bottom of the code editor are 'Run code' and 'Debug' buttons. To the right of the code editor is a canvas showing a turtle cursor and a partially drawn star. Below the canvas is a color palette with the text 'colors: red, green, blue, yellow, purple, pink' and a dropdown arrow. At the very bottom, there are buttons for 'Expand output' and 'Save drawing'.

# Gradual syntax approach



- ▶ Teaching children syntax just like learning punctuation
- ▶ Gradually learning syntax and concepts

(Gilsing and Hermans, 2021; Hermans, 2020)



# Gradual syntax approach

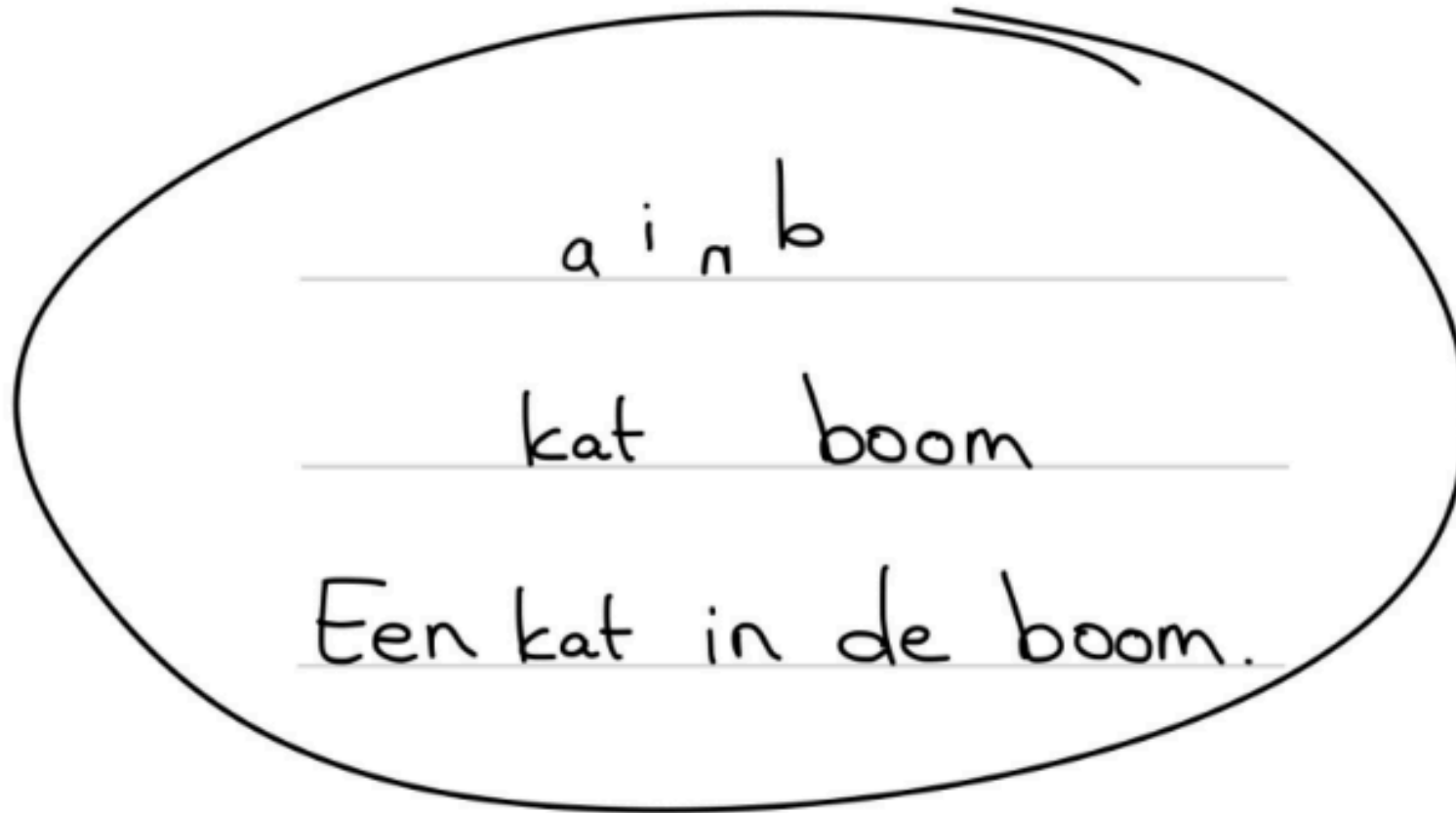


Figure 5: How students learn to write



# Gradual syntax approach



## Syntax in level 3:

Hedy

```
1 choices is stone, paper, scissors
2 print I choose choices at random
```

## Syntax in level 16:

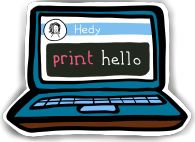
Hedy

```
1 choices = ['stone','paper','scissors']
2 print("I choose ", choices[random])
```



# STUDENT INTERFACE

# Levels and adventures



- ▶ Adventures guide step by step
- ▶ Levels: basic, advanced and expert

Home Hedy English Log in

Level 3 — random

**At random**

In this level you can make a list using the `is` command. You can let the computer choose a random item from that list. You do that with `at random`.

You can use the `at random` command in a sentence as well.

**Exercise**

Try out the `at random` command by making your own gameshow (like the ones on tv) where you choose a door or suitcase and it contains a big prize! Can you do it? We have already put the first lines into the example code.

```
1 print The big gameshow!
2 print There are 3 suitcases in front of you...
3 chosen is ask Which suitcase do you choose?
4 prizes is
5
6
```

```
animals is dogs, cats, kangaroos
print animals at random
```

```
food is sandwich, slice of pizza, salad, burrito
print I am going to have a food at random for lunch.
```

```
print The big gameshow!
print There are 3 suitcases in front of you...
chosen is ask Which suitcase do you choose?
prizes is
```

Level 9 — draw it!

Level 1

Level 2

Level 3

Level 4

Level 5

Level 6

Level 7

Level 8

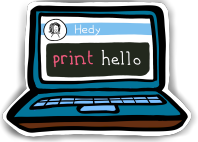
Level 9

repeat  
fortune teller

repeat 2  
sing a song!  
music

if & else  
story

# Levels and adventures



```
1 colors is red, green, blue, yellow, purple, pink
2 repeat 5 times
3   color colors at random
4   forward 100
5   turn 145
```



colors: red,green,blue,yellow,purple,pink

◀ Expand output

Save drawing

# What will this code do?



Hedy

```
1 print("Hello there!")
```

# Clear error messages and warnings



Hedy

```
1 print("Hello there!")
```

```
>>> print("Hello there!")
      File "<python-input-0>", line 1
        print("Hello there!")
      IndentationError: unexpected indent
>>> █
```

Figure 9: Indentation error in Python

# Clear error messages and warnings



Hedy

```
1 print("Hello there!")
```



We detected that line 2 started with a space. Can you try removing the space?



Figure 10: Indentation 'error' in level 2



We detected that **a space** is being used on line 7 which is not allowed. Can you try looking for a missing or an extra character on your code?



Figure 11: Indentation error in level 6

# Clear error messages and warnings



```
>>> print(friuts)
Traceback (most recent call last):
  File "<python-input-9>", line 1, in <module>
    print(friuts)
          ^^^^^^
NameError: name 'friuts' is not defined
>>> █
```

Figure 12: Variable not found in Python



 We detected that variable `friuts` is being used before being set. Can you set the variable before it is used or use quotation marks for `friuts`? 

Figure 13: Variable not found in Hedy (level 14)





# NATIVE LANGUAGE SUPPORT

# Over 30 languages available!



English

Hedy

```
1 number_1 = numbers at random
```

Français

Hedy

```
1 nombre_1 = nombres au hasard
```

中文 (简体)

Hedy

```
1 数一 = 一组数 在 随机
```

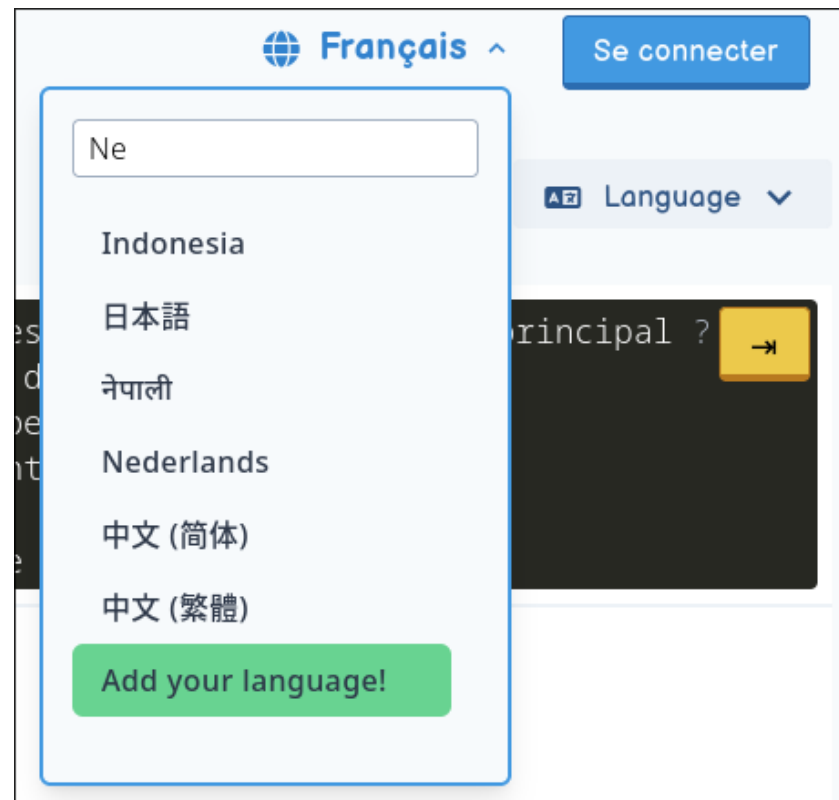
print hello  
打印 你好  
قول مرحبا

► And many more!

# Help translating :)



- ▶ Is your language available?
  - No? Add your language!
  - Yes? Help with updating content!
- ▶ No programming experience needed!





# TEACHER INTERFACE

# Manage your classes



## My classes

Create a class to follow the progress of each student in dashboard, and to customize the adventures your students see, and even adding your own! You can create as many classes as you like, and each class can have multiple teachers each one with different roles. You can also add as many students as you want, but mind that each student can only be in one class at a time. You can find more information about classes in the [teacher manual](#).

[Create a new class](#)[Hide classes ^](#)

Name	Teacher	Students	Actions				
[REDACTED]	weijsenfeld	28	Customize	Update	Duplicate	Preview	Remove
[REDACTED]	weijsenfeld	30	Customize	Update	Duplicate	Preview	Remove
[REDACTED]	weijsenfeld	36	Customize	Update	Duplicate	Preview	Remove
<a href="#">Test</a>	weijsenfeld	8	Customize	Updated	Duplicate	Preview	Remove

## My adventures

Each Hedy level has built-in exercises for students, which we call adventures. You can create your own adventures and add them to your classes. With your own adventures you can create adventures that are relevant and interesting for your students. You can find more information about creating your own adventures [here](#).

[Create adventure](#)[View adventures v](#)

# Fully customizable levels



[← Go back](#)

**Customize class: Test**

**Select and order adventures**

Level 1

Add

Reset

Create adventure

print

ask

parrot

rock, paper, scissors

haunted house

story

music

turtle

draw it!

restaurant

fortune teller

debugging

hospital

Vrij Programmeren

**Other settings**

Option	Select?
Hide keyword switcher	<input type="checkbox"/>

[Opening dates](#)

Preview

Remove customization

# Create custom adventures



[← Go back](#)

## Customize adventure:

[General settings](#) [Adventure](#) [Preview](#) [Solution Example](#)

Paragraph

**B** *I*

This is the explanation of my adventure! This way I can show a command: `print` But sometimes I might want to show a piece of code, like this:

ask What's your name?  
echo so your name is

Hedy

Preview

<> Adventure Code

Use this button when you want to create a block of code that students can run in your adventure. Tip: put the selection at the end of the last line of the code block and `Enter` 3 times to type after a code block.

Make sure you always surround keywords with { } when you write them outside of code blocks, then they are recognized correctly. You can use the "preview" button to view a styled version of your adventure. To view the adventure on a dedicated page, select "view" from the teachers page.

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# Create student accounts



► No emails needed!

[← Go back](#)

Create student accounts for Test

Auto generate passwords

**U** **s** **e** **r** **n** **a** **m** **e** **s**

Enter one username per line or paste them from a spreadsheet.

Madeline  
Lucia  
Femke  
Thom  
Dennis  
Louis  
Gabriel

Create accounts





# ROADMAP 2026

# Roadmap 2026



- ▶ Significant teacher interface improvements
- ▶ Workbooks

# Roadmap 2026

## Teacher interface changes: Grading



### Redacted Class Name :)

#### Grading

The table shows program submitted by your students. The filters will let you filter for all or one of a level, student and/or adventure; the filter becomes effective after clicking the 'Filter' button. By clicking on the buttons besides the table headers, you can also sort the table.

Level All ▾

Students All ▾

Adventures All ▾

Filter

LEVEL ▴ ▾	STUDENT ▴ ▾	ADVENTURE ▴ ▾	DATE ▴ ▾	ACCEPTED ▴ ▾
1	[REDACTED]	debugging	▾ Apr 15, 2025	✓
1	[REDACTED]	fortune teller	▾ Apr 15, 2025	✓
		draw it!	▴	
1	[REDACTED]	<pre>1 turn right 2 forward 15 3 turn left 4 forward 15 5 turn right 6 forward 15 7 turn left 8 forward 15 9 turn right 10 forward 15</pre>	Apr 15, 2025	✓
		<span>View program</span>		
2	[REDACTED]	rock, paper, scissors 2	▾ Apr 15, 2025	✓

Figure 20: Better interface to show and grade submitted programs

# Roadmap 2026

## Teacher interface changes: Creating new classes



### Create a new class

Class name

☐ Standard new class  
Create a class with the adventures made by the Hedy team included.

☐ Copy existing class  
Create a new class including the settings and adventures from an existing class. This will not bring over students.  
Class  ▼

☐ Invite the second teachers from the other class to this one?

☐ Class without adventures  
Create a class with no adventures included.

Figure 21: More options when creating a new class

# Roadmap 2026

## Teacher interface changes: Calm class overview



## Classes

### Active Classes

NAME	TEACHER	STUDENTS	CREATED	ACTIONS
<a href="#">redacted class 1</a>	weijnsenfeld	28	Apr 14, 2025	...
<a href="#">redacted class 2</a>	weijnsenfeld	30	Apr 7, 2025	...
<a href="#">redacted class 3</a>	weijnsenfeld	36	Apr 7, 2025	...
<a href="#">Test</a>	weijnsenfeld	8	Nov 14, 2025	...

Create a new class

Grading

Configure

Archive

Delete

Figure 22: Quick access to grading, configuration, archiving and deleting

# Roadmap 2026

Teacher interface changes: All materials clearly in one place

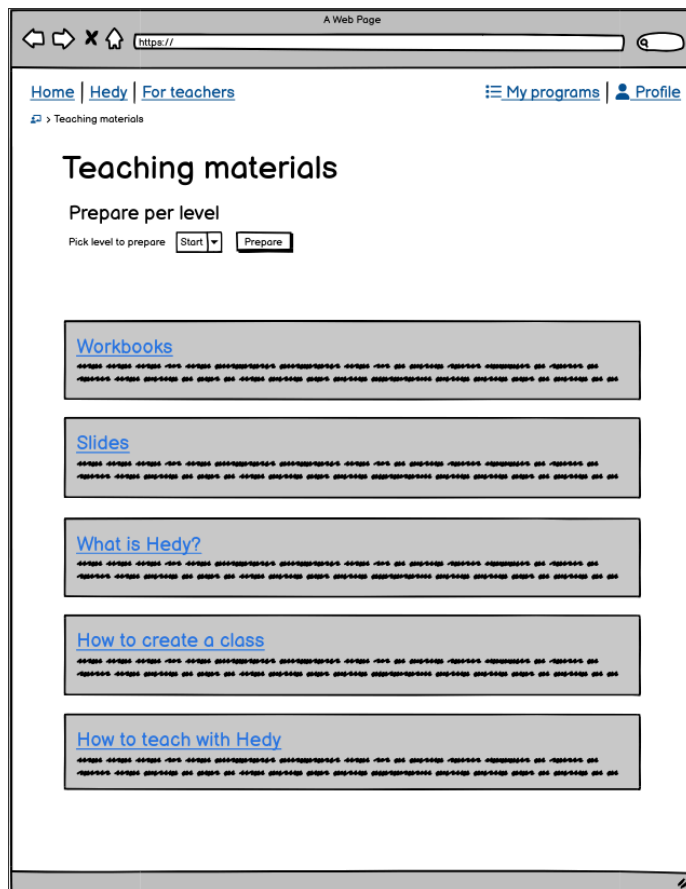


Figure 23: Overview of all teaching materials

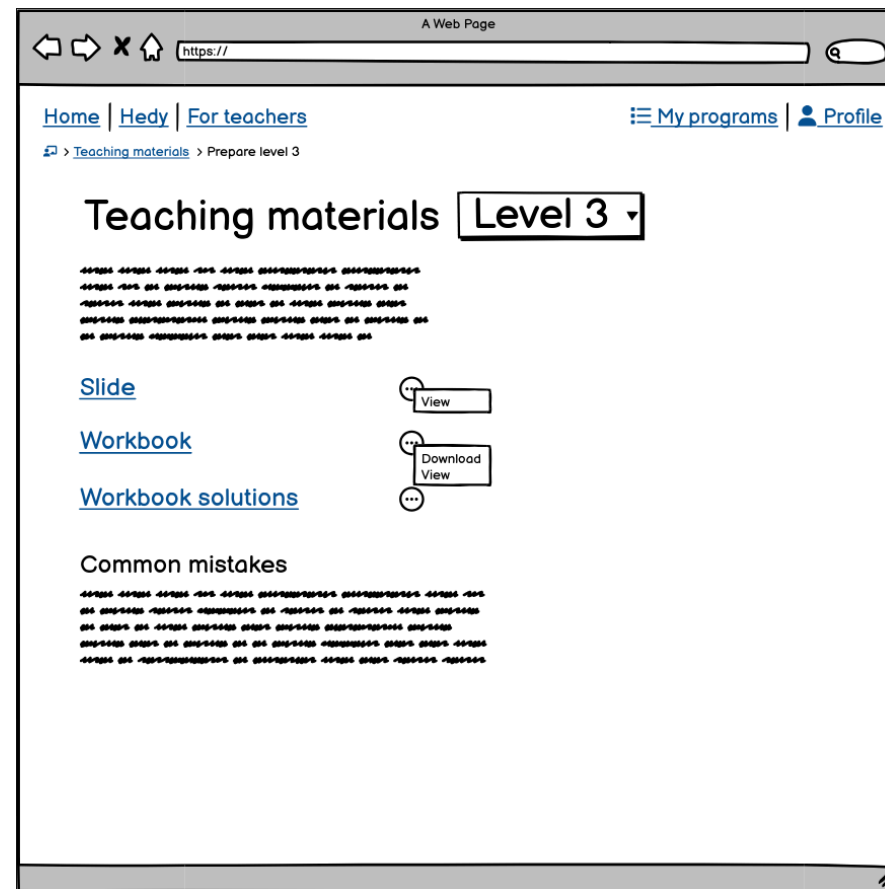


Figure 24: Prepare your class per level

# Roadmap 2026

## New workbooks



**Question:** Circle variables in this code:

```
name is Hedy
print Hello name
age is 17
print You are age years old
```

**Question:** Circle places where the variable is **being set** in this code:

```
name is Hedy
print Hello name
age is 17
print You are age years old
```

**Question:** Circle places where the variables are **being used** in this code:

```
name is Hedy
print Hello name
age is 17
print You are age years old
```

Figure 25: Students are asked questions on paper about variables

### Output

**Question:** What is the output of this code?

```
teachers is Hermans, Merbis, Bagci, Senkal
print Today teachers at random will be teaching you!
```

### Output

**Question:** What is the output of this code?

```
teachers is Hermans, Merbis, Bagci, Senkal
print Today's teacher is Hermans.
```

Figure 26: Students are asked to predict the output of the code

# Many more ways to contribute!



- ▶ As a developer
- ▶ As an educator
- ▶ As a translator

A blue arrow with a black outline starts from the 'print' keyword in the first code block and points to the 'print' keyword in the second code block.

```
print Hello
```

```
for times in range 1 to 10  
  print times 'x 4 = ' times # 4
```



# Many more ways to contribute!



[hedy.org](https://hedy.org)



[github.com/hedyorg/hedy](https://github.com/hedyorg/hedy)



# THANK YOU!

Hedy - Textual programming made easy

# Bibliography



Gilsing, M., and Hermans, F. (2021). Gradual Programming in Hedy: A First User Study. *2021 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC)*, 1–9. <https://doi.org/10.1109/VL/HCC51201.2021.9576236>

Hermans, F. (2020). Hedy: A Gradual Language for Programming Education. *Proceedings of the 2020 ACM Conference on International Computing Education Research*, 259–270. <https://doi.org/10.1145/3372782.3406262>