


CRACKING
THE CASE WITH

FLEXBOX





Level 1 – Section 1

Foreshadowing Flexbox

A Display Type Created for Common Patterns

CSS Flexible Box Layout Module Level 1

Flexbox is a collection of CSS properties used to align content and distribute space.

Flex Containers: the **'flex'** and **'inline-flex'** **'display'** values

Flex Items

Absolutely-Positioned Flex Children
Flex Item Margins and Paddings
Flex Item Z-Ordering
Collapsed Items
Implied Minimum Size of Flex Items

Ordering and Orientation

Flex Flow Direction: the **'flex-direction'** property
Flex Line Wrapping: the **'flex-wrap'** property
Flex Direction and Wrap: the **'flex-flow'** shorthand
Display Order: the **'order'** property
Reordering and Accessibility

Flex Lines

Flexibility

The **'flex'** Shorthand
Basic Values of **'flex'**
Components of Flexibility
The **'flex-grow'** property
The **'flex-shrink'** property
The **'flex-basis'** property

Alignment

Aligning with auto margins

CSS Flexible Box Layout Module Level 1

W3C Candidate Recommendation, 26 May 2016

This version:

<http://www.w3.org/TR/2016/CR-css-flexbox-1-20160526/>

Latest published version:

<http://www.w3.org/TR/css-flexbox-1/>

Editor's Draft:

<https://drafts.csswg.org/css-flexbox/>

Previous Versions:

<http://www.w3.org/TR/2016/CR-css-flexbox-1-20160301/>
<http://www.w3.org/TR/2015/WD-css-flexbox-1-20150511/>
<http://www.w3.org/TR/2014/WD-css-flexbox-1-20140922/>
<http://www.w3.org/TR/2014/WD-css-flexbox-1-20140322/>
<http://www.w3.org/TR/2012/CR-css3-flexbox-20120918/>
<http://www.w3.org/TR/2012/WD-css3-flexbox-20120612/>
<http://www.w3.org/TR/2012/WD-css3-flexbox-20120322/>
<http://www.w3.org/TR/2011/WD-css3-flexbox-20111129/>
<http://www.w3.org/TR/2011/WD-css3-flexbox-20110322/>
<http://www.w3.org/TR/2009/WD-css3-flexbox-20090723/>

Feedback:

www-style@w3.org with subject line "[css-flexbox] ..."

Test Suite:

http://test.csswg.org/suites/css-flexbox-1_dev/nightly-ua/

Editors:

[Tab Atkins Jr.](#) (Google)

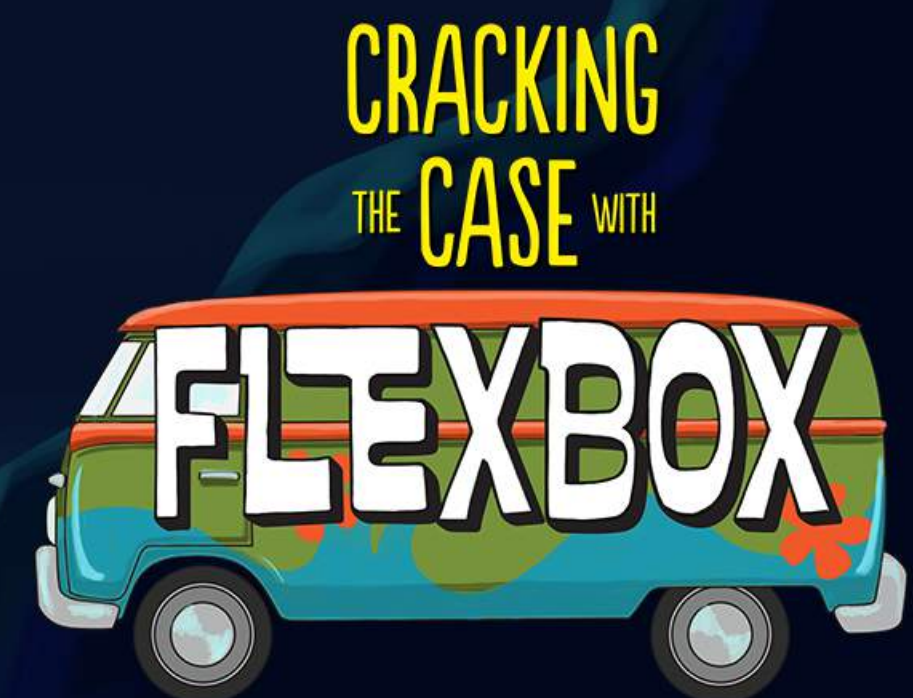
- Two new display values
- 11 new properties
- <http://go.codeschool.com/flexbox-spec>
- <http://go.codeschool.com/caniuse-flexbox>

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UI Patterns in Flexbox

- Equal heights
- Vertically centered content
- Media objects
- Sticky footers
- Column layouts



Flexbox Is a New Display Type

Flexbox adds flex containers, flex items, and flex lines in addition to new properties.

- Block layout
- Table layout
- Inline layout
- Positioning layout
- Flex layout
 - Flex containers
 - Flex items
 - Flex lines

*Learn about other layouts
and core HTML and CSS in
these courses.*



Default Behaviors of Elements

index.html

HTML

```
<article class="setup">This ...  
  <img height="150" height="150" ...>  
  <p>...</p>  
</article>
```

site.css

CSS

```
article {  
  border: 1px solid #d1eda6; }
```

display: block



display: inline

This pipe was found outside the door of the amusement park office, soon after the ghost was seen flying by.

display: block

Overriding Default Behaviors

HTML

index.html

```
<article class="setup">This ...  
<img height="150" ...>  
<p>...</p>  
</article>
```

site.css

CSS

```
article {  
  border: 1px solid #dada6;  
  display: inline; }  
!dada6;
```



Collapsed

This pipe was found outside the door of the amusement park office, soon after the ghost was seen flying by.

Flex Containers Control Layout of Child Items

index.html

HTML

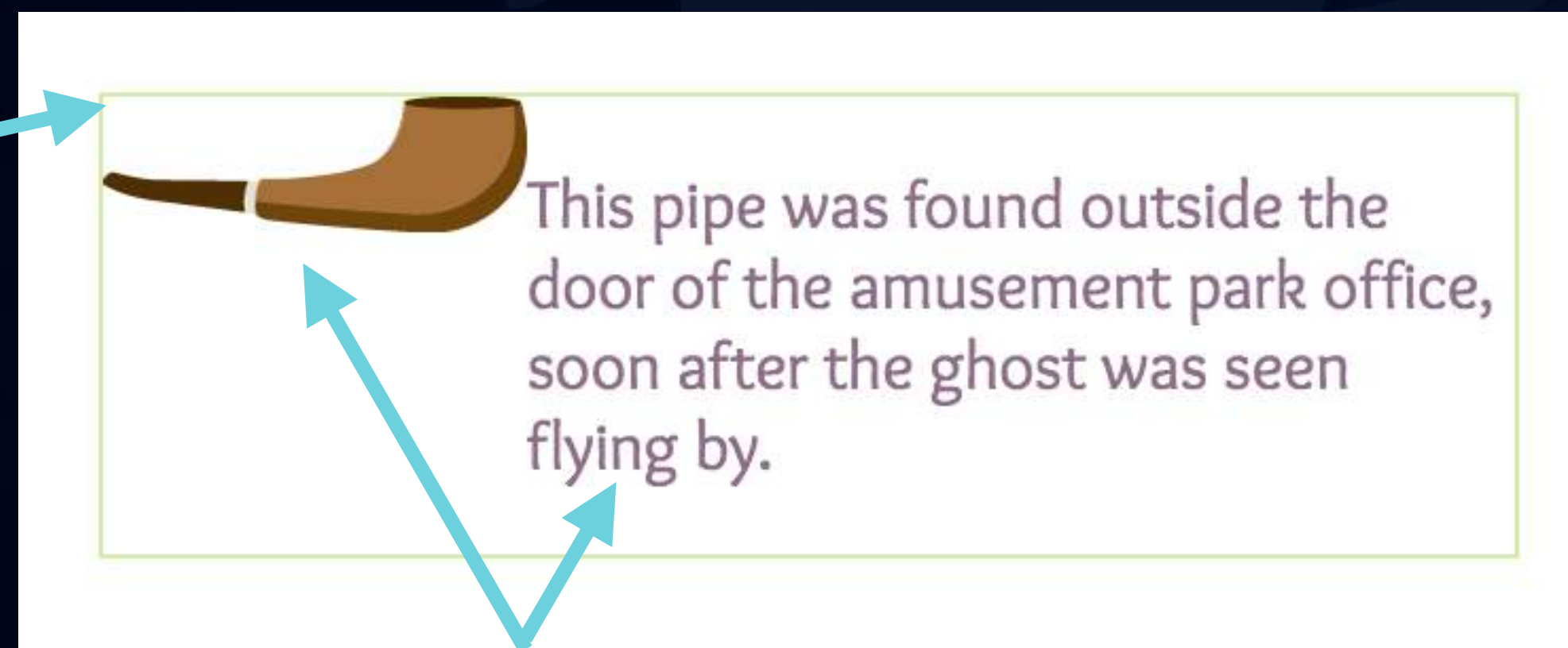
```
<article class="setup">This ...  
  <img height="150" height="150" ...>  
  <p>...</p>  
</article>
```

site.css

CSS

```
article {  
  border: 1px solid #d1eda6;  
  display: flex; }
```

Flex container



Aligned horizontally

display: flex Creates a Block-level Container

index.html

HTML

```
<article class="setup">This ...  
  <img height="150" height="150" ...>  
  <p>...</p>  
</article>
```

site.css

CSS

```
article {  
  border: 1px solid #d1eda6;  
  display: flex; }
```



This pipe was found outside the door of the amusement park office, soon after the ghost was seen flying by.

Uses all available width

display: inline-flex Creates an Inline Container

index.html

HTML

```
<article class="setup">This ...  
  <img height="150" height="150" ...>  
  <p>...</p>  
</article>
```

site.css

CSS

```
article {  
  border: 1px solid #d1eda6;  
  display: inline-flex; }
```



This pipe was found outside the door of the amusement park office, soon after the ghost was seen flying by.

*Container adjusts to
width of the content*

Flex Items Are Distributed Along Flex Lines

Flex items are direct children of a flex container and can be HTML elements or text.

index.html

HTML

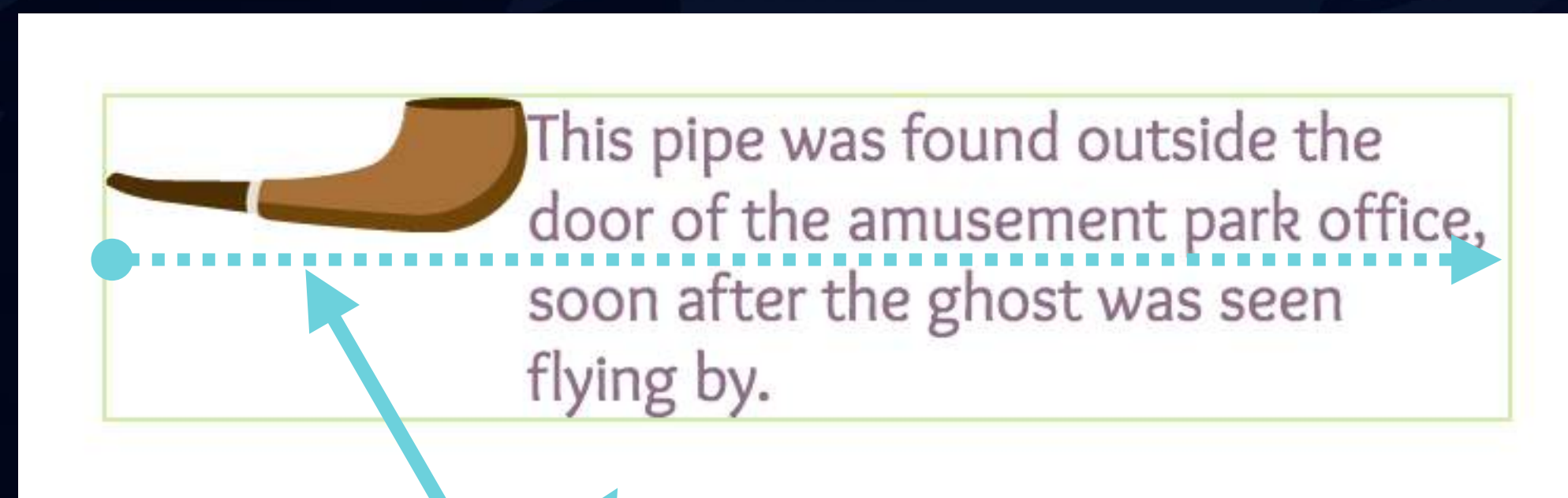
```
<article class="setup">This ...  
  <img height="150" height="150" ...>  
  This pipe was found outside...  
</article>
```

site.css

CSS

```
article {  
  border: 1px solid #d1eda6;  
  display: flex; }
```

No HTML element — just text



Two flex items fill the available space of a horizontal flex line

Flex Item Spacing

A spacing algorithm is used to distribute space of all flex items across a single flex line.

index.html

HTML

```
<article class="setup">This ...  
  <img height="150" height="150" ...>  
  <h3>...</h3>  
  <p>...</p>  
</article>
```

site.css

CSS

```
article {  
  border: 1px solid #d1eda6;  
  display: flex; }
```

Three flex items



Tobacco
Pipe

This pipe was found
outside the door of the
amusement park office,
soon after the ghost
was seen flying by.

Grouping Elements Into Flex Items

Grandchild elements do not become flex items.

index.html

HTML

```
<article class="setup">This ...  
  <img height="150" height="150" ...>  
  <div>  
    <h3>...</h3>  
    <p>...</p>  
  </div>  
</article>
```

site.css

CSS

```
article {  
  border: 1px solid #d1eda6;  
  display: flex; }
```

Two flex items

Two flex items




Tobacco Pipe

This pipe was found outside the door of the amusement park office, soon after the ghost was seen flying by.

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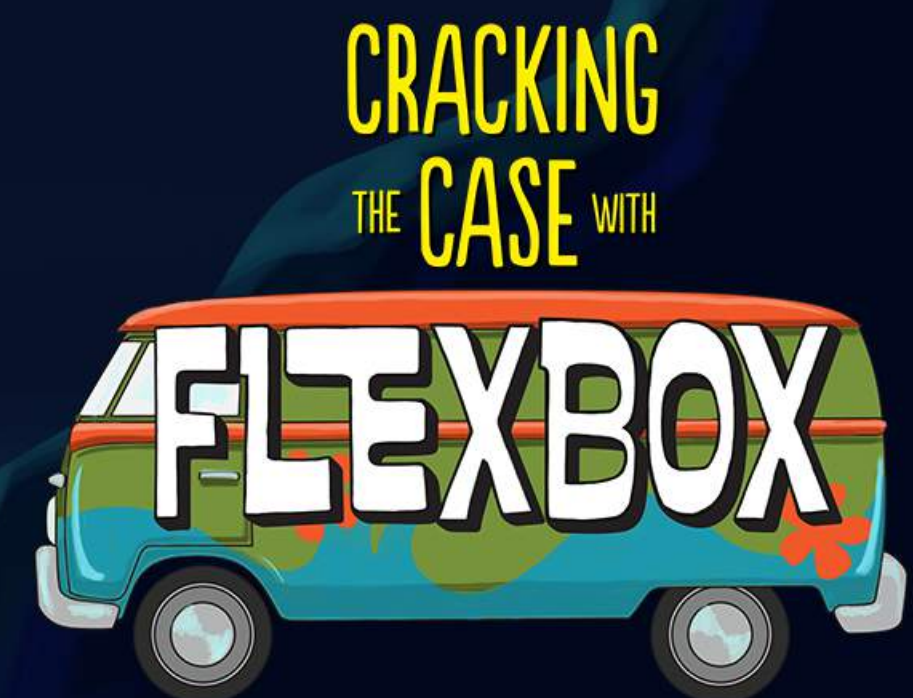
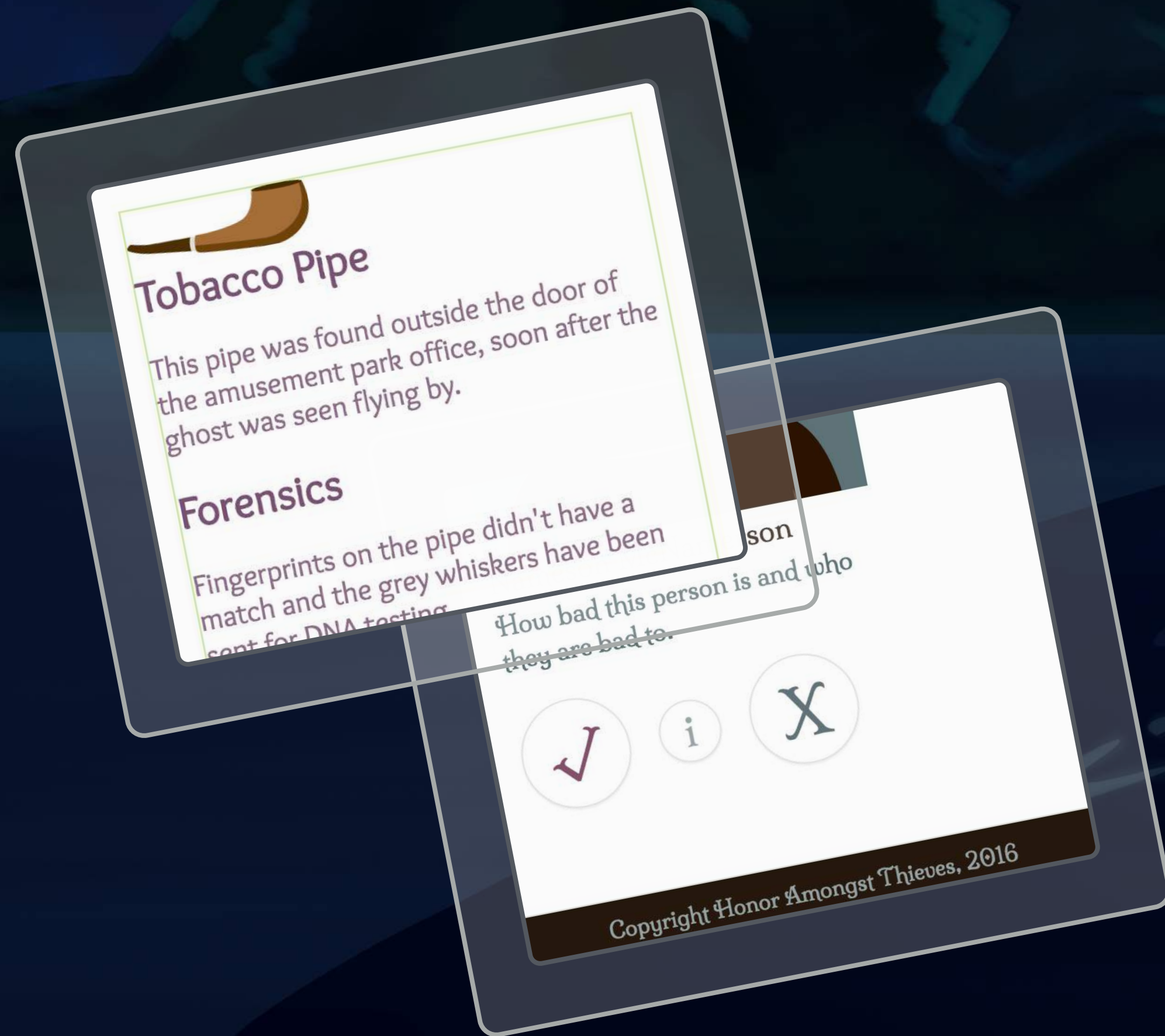
Level 1 – Section 2

Foreshadowing Flexbox

Wily Wrapping

Flexbox Wrapping and Direction Examples

- Displaying flex items across multiple lines
- Changing the direction of flex lines
- Distributing space vertically



Problem: Wanting Flex Items to Stack

index.html

HTML

```
<article class="clue">
  <img height="150" height="150" ...>
  <div>
    <h3>...</h3>
    <p>...</p>
    <h3>...</h3>
    <p>...</p>
  </div>
</article>
```

These could go below the image

320px wide



Tobacco Pipe

This pipe was found outside the door of the amusement park office, soon after the ghost was seen flying by.

Forensics

Fingerprints on the pipe didn't have a match and the grey whiskers have been sent for DNA testing.

Solution: flex-wrap

This property's default value is nowrap and it accepts: nowrap | wrap | wrap-reverse.

index.html

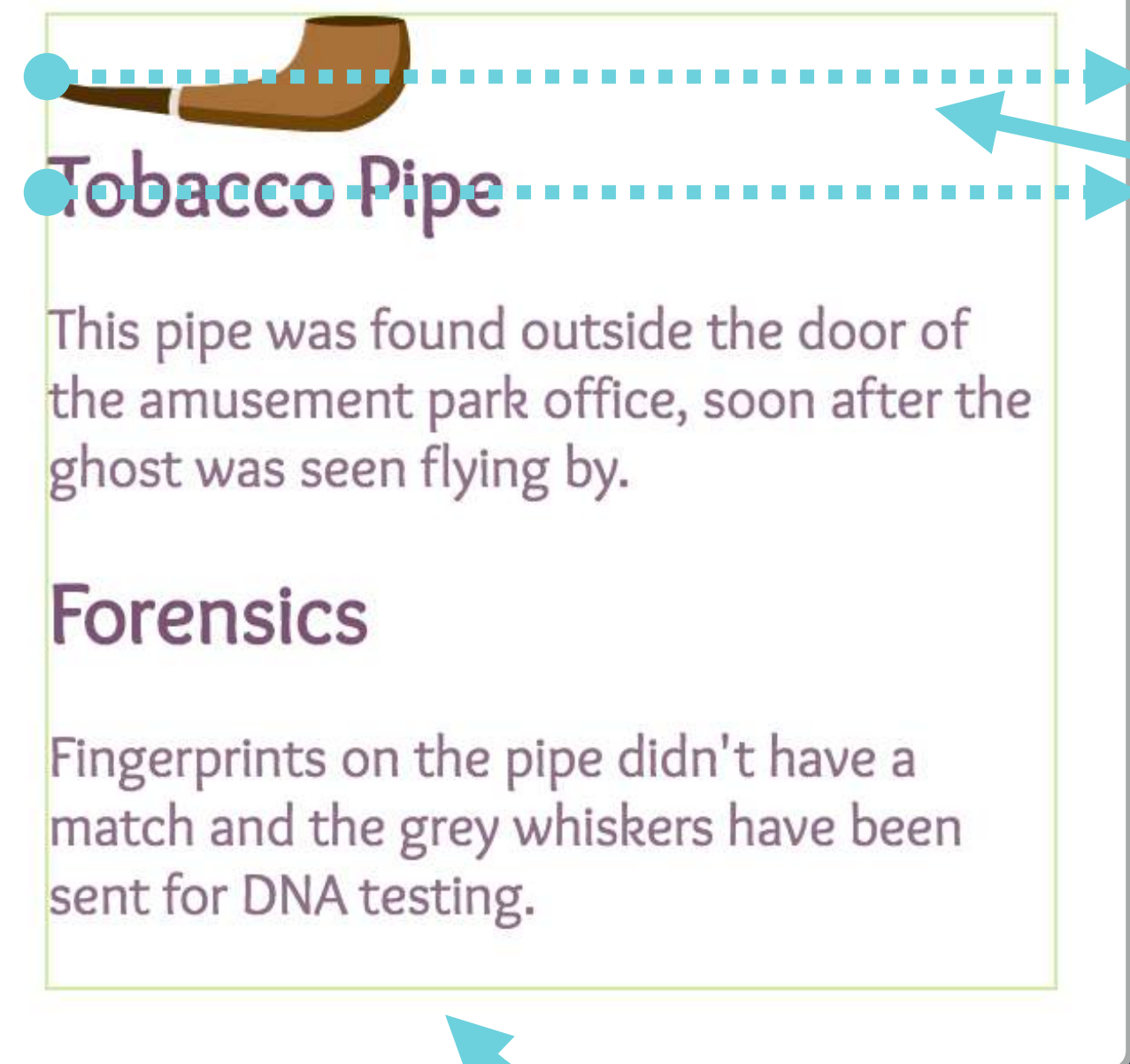
HTML

```
<article class="clue">...</article>
```

site.css

CSS

```
.clue {  
  border: 1px solid #d1eda6;  
  display: flex;  
  flex-wrap: wrap;  
}
```



The div can't fit here, so it wraps

320px wide

Put It in Reverse?

The first of the flexbox properties that allows for rendering items in reverse.

index.html

HTML

```
<article class="clue">...</article>
```

site.css

CSS

```
.clue {  
  border: 1px solid #d1eda6;  
  display: flex;  
  flex-wrap: wrap-reverse; }  
}
```

Tobacco Pipe

This pipe was found outside the door of the amusement park office, soon after the ghost was seen flying by.

Forensics

Fingerprints on the pipe didn't have a match and the grey whiskers have been sent for DNA testing.



The flex items reverse in order

Problem: Wanting Flex Items to Always Stack

index.html

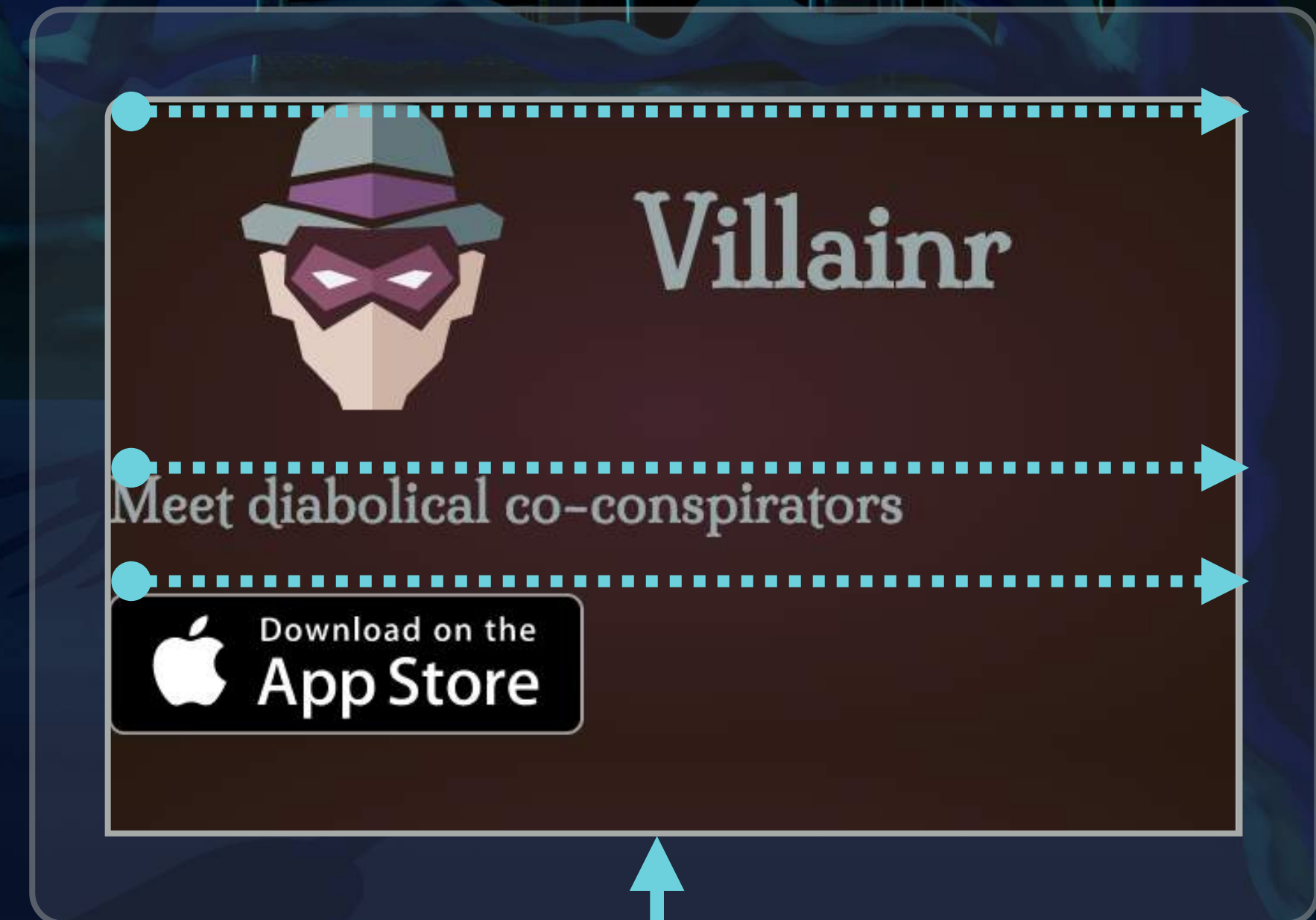
HTML

```
<main>
  <img ...>
  <h1>...</h1>
  <p>...</p>
  <a>...</a>
</main>
```

site.css

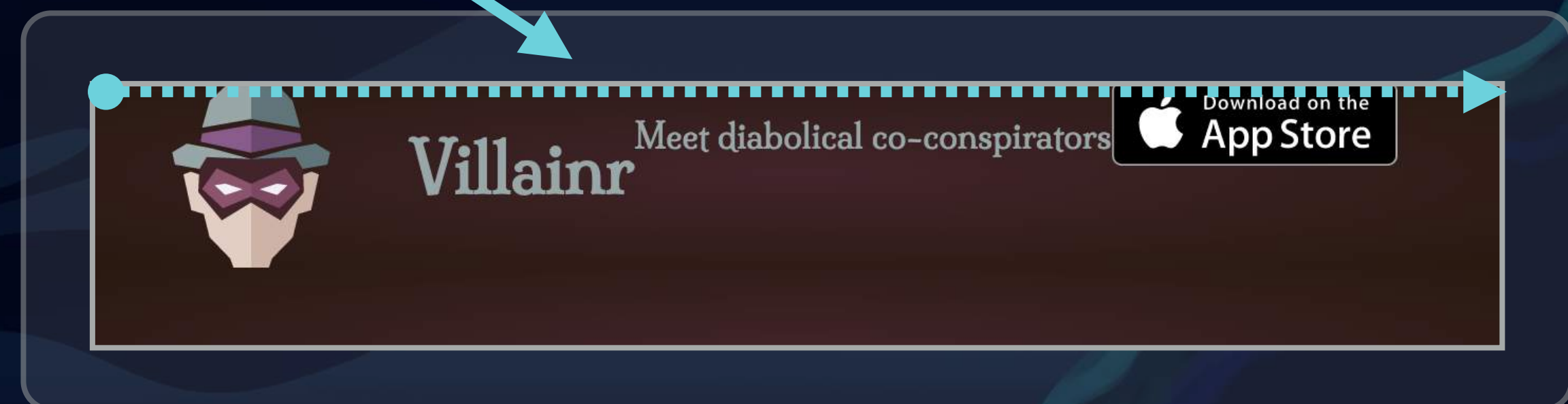
CSS

```
main {
  display: flex;
  flex-wrap: wrap; }
```



667px wide

320px wide



Solution: flex-direction

The default value is `row` and it accepts: `row` | `row-reverse` | `column` | `column-reverse`.

index.html

HTML

```
<main>
  <img ...>
  <h1>...</h1>
  <p>...</p>
  <a>...</a>
</main>
```

site.css

CSS

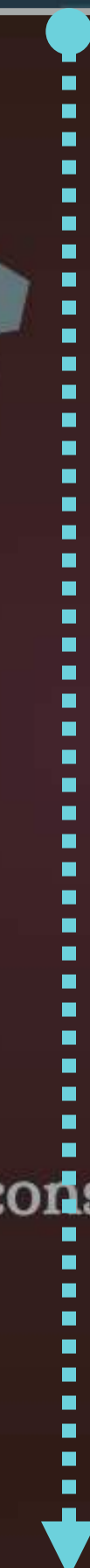
```
main {
  display: flex;
  flex-direction: column; }
```

*Flex items
display
vertically*



Villainr

Meet diabolical co-conspirators



Page Layout With flex-direction

Main elements for layout are flex items with the `column` direction.

index.html

HTML

```
<body>
  <header>...</header>
  <main>...</main>
  <footer>...</footer>
</body>
```

site.css

CSS

```
body {
  ...
  display: flex;
  flex-direction: column; }
```

header

main

footer



Mixing in Some Non-flexbox CSS

Setting the page elements to 100% height uses all available space.

index.html

HTML

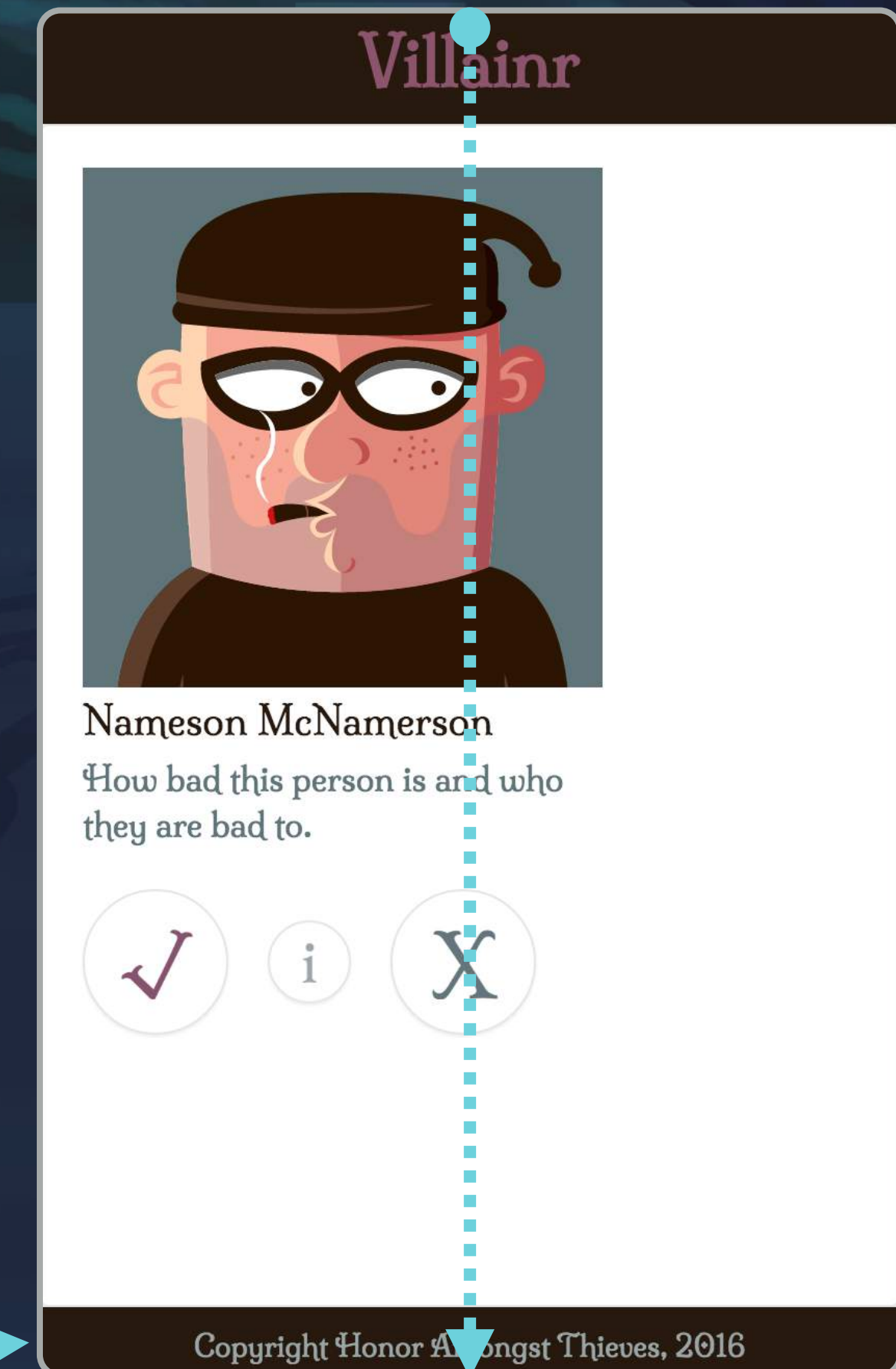
```
<body>
  <header>...</header>
  <main>...</main>
  <footer>...</footer>
</body>
```

site.css

CSS

```
html, body, main {
  height: 100%; }
```

*Stays at the bottom
of the screen*



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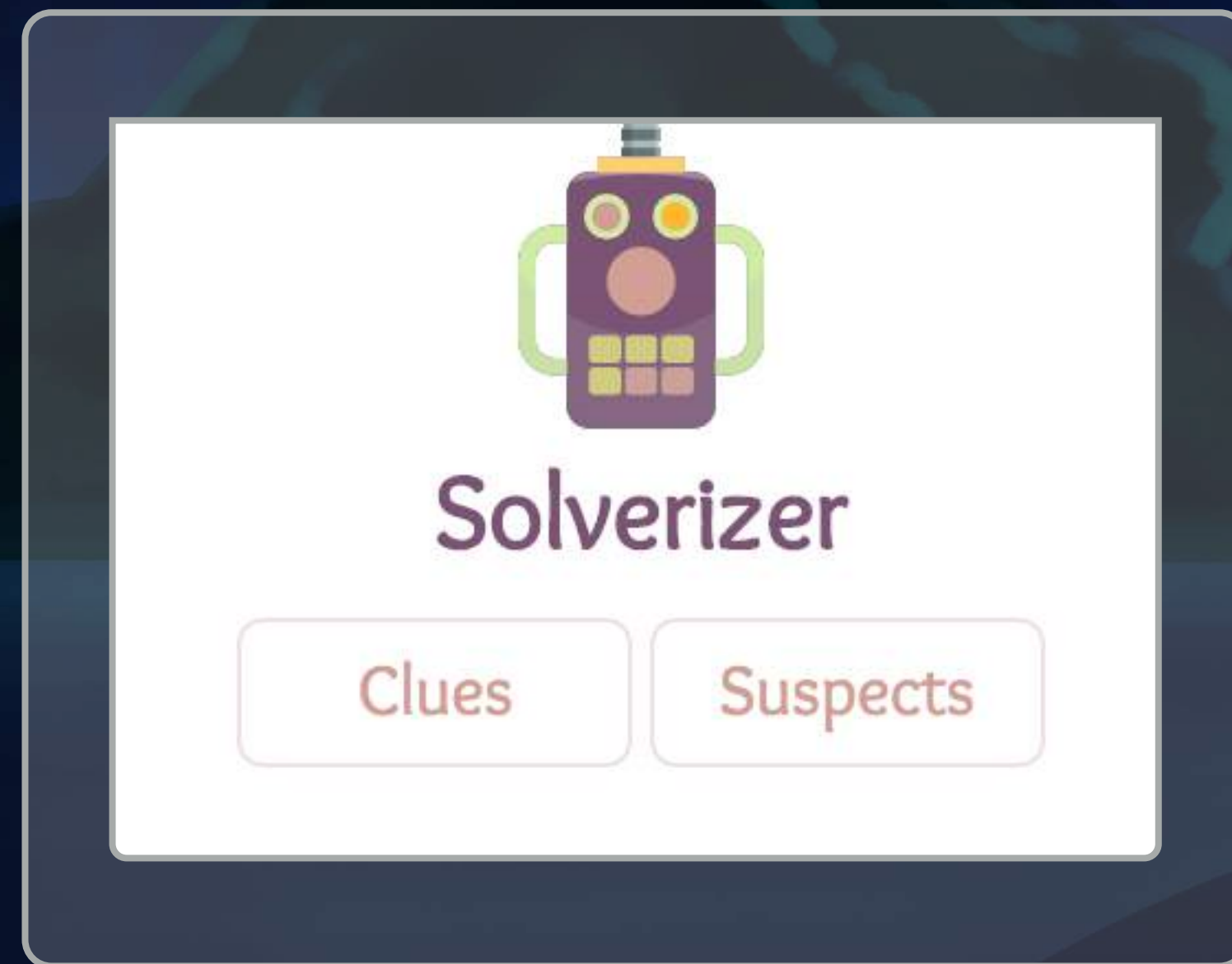


Level 2 – Section 1

Justification and Order

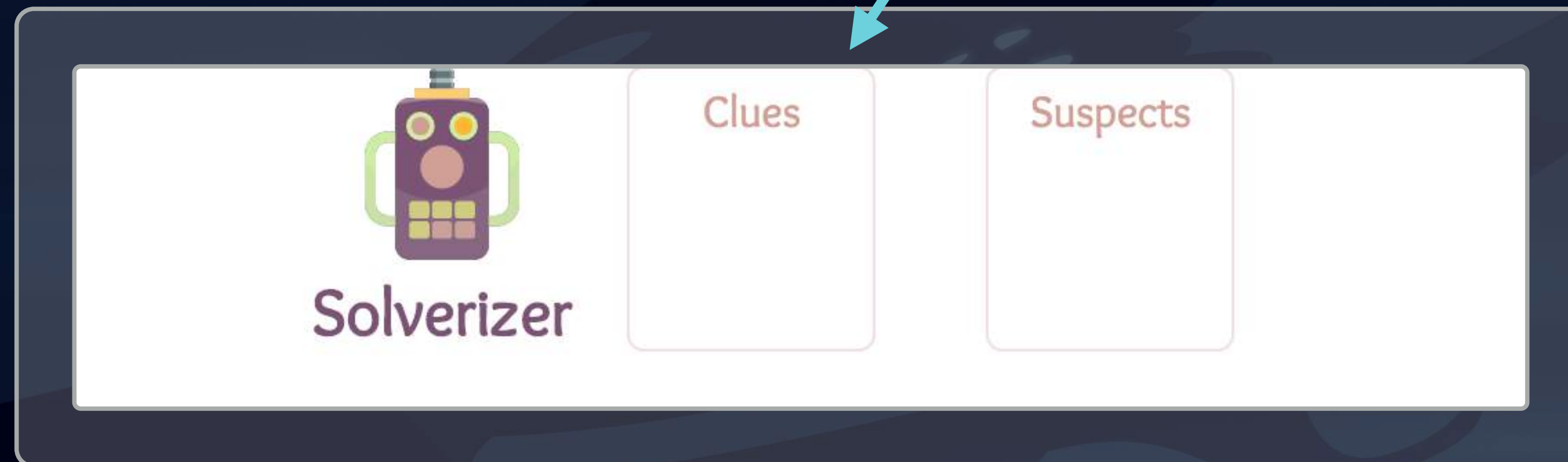
Distributing Space Along Flex Lines

Example Patterns



Positioning elements vertically

Positioning elements horizontally



Flex Items Are Distributed Along Axes

The main axis is determined by the `flex-direction`.

index.html

HTML

```
<nav>
  <a ...>...</a>
  <a ...>...</a>
  <a ...>...</a>
</nav>
```

site.css

CSS

```
@media screen and (min-width: 375px) {
  nav {
    display: flex; } }
```

start

center

end



Solverizer

Clues

Suspects

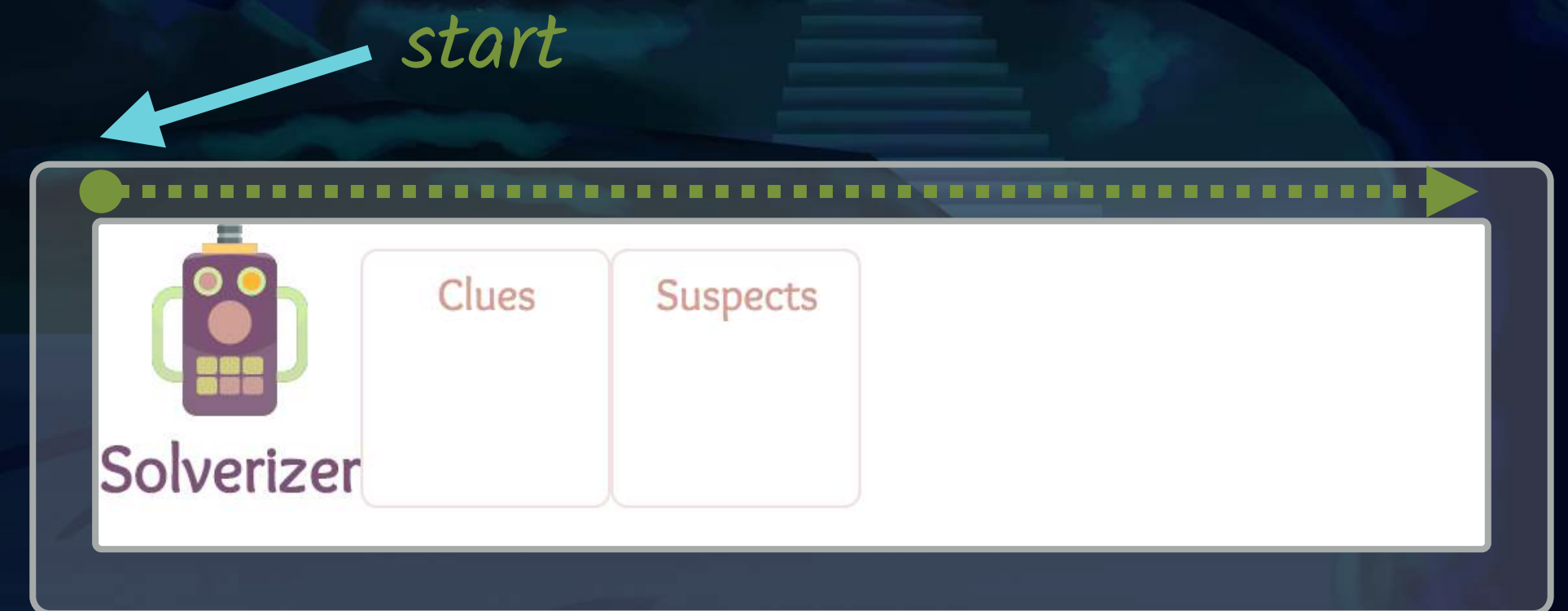
justify-content

Used to distribute space on the main axis, the default value is **flex-start** and it accepts:
flex-start | **flex-end** | **center** | **space-between** | **space-around**.

site.css

CSS

```
@media screen and (min-width: 375px) {  
  nav {  
    display: flex;  
    justify-content: flex-start; } }
```



site.css

CSS

```
@media screen and (min-width: 375px) {  
  nav {  
    display: flex;  
    justify-content: flex-end; } }
```



Spacing Values for justify-content

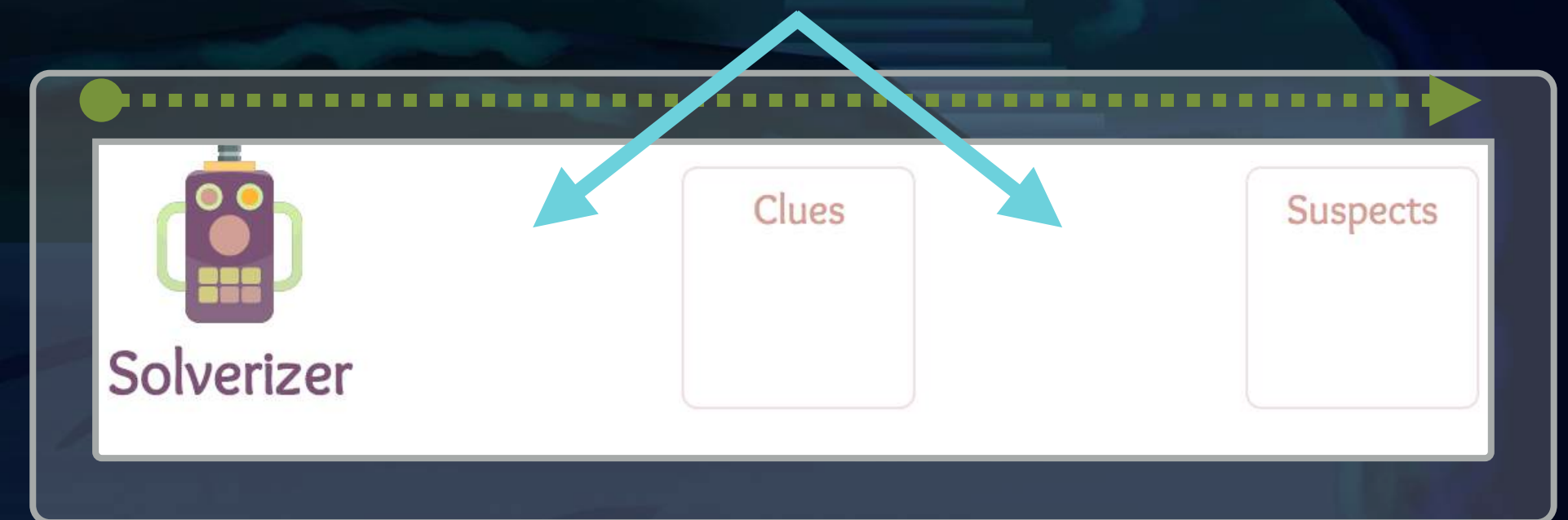
Flexbox's spacing algorithm distributes available space between elements.

site.css

CSS

```
@media screen and (min-width: 375px) {  
  nav {  
    display: flex;  
    justify-content: space-between; } }
```

Flush to edges, space in between

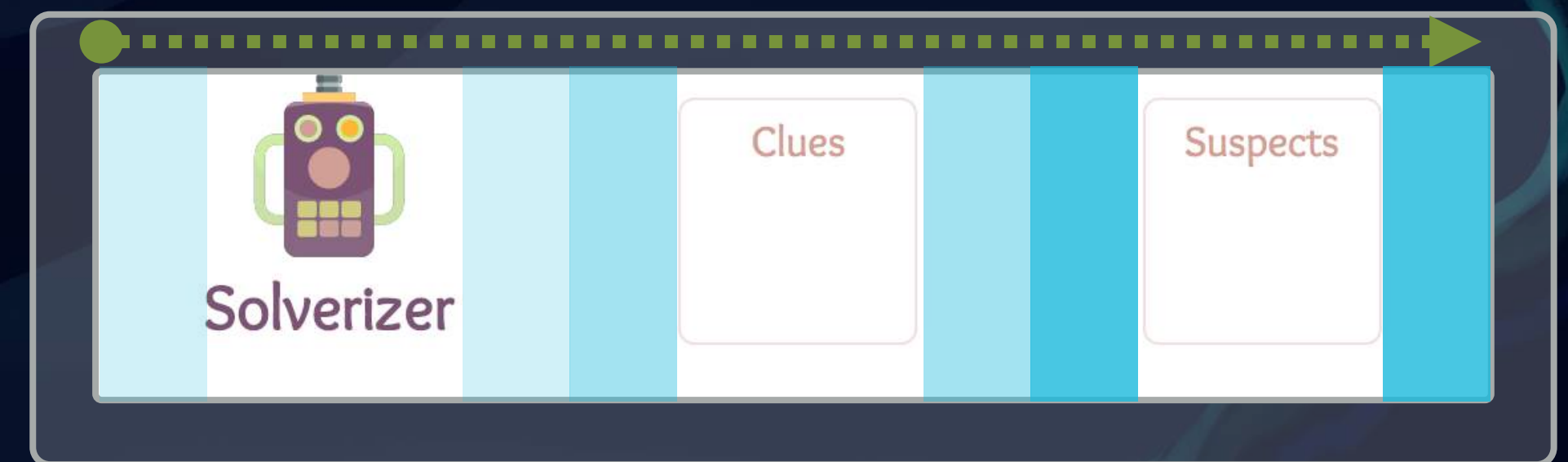


site.css

CSS

```
@media screen and (min-width: 375px) {  
  nav {  
    display: flex;  
    justify-content: space-around; } }
```

Space added around each element



Our Example Uses center

index.html

HTML

```
<nav>
  <a ...>...</a>
  <a ...>...</a>
  <a ...>...</a>
</nav>
```

site.css

CSS

```
@media screen and (min-width: 375px) {
  nav {
    display: flex;
    justify-content: center; } }
```

Content center aligns with container center



Adding Space With Non-flexbox CSS

Margin and padding can be applied to flex items.

index.html

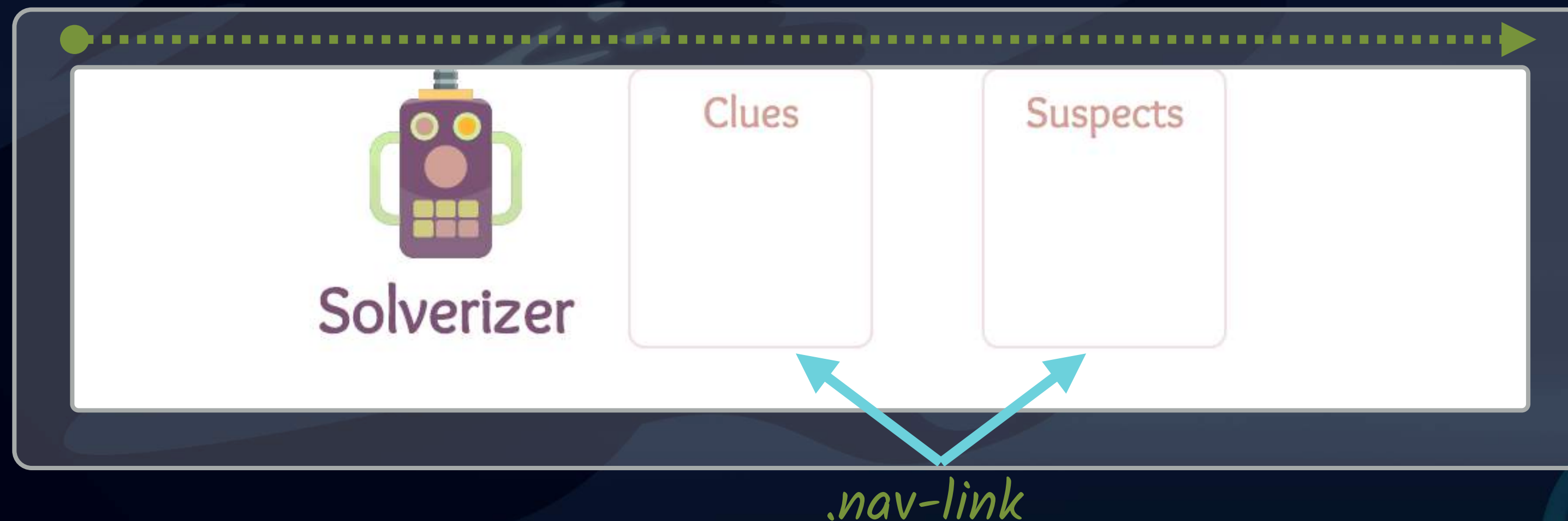
HTML

```
<nav>
  <a class="nav-brand">...</a>
  <a class="nav-link">...</a>
  <a class="nav-link">...</a>
</nav>
```

site.css

CSS

```
@media screen and (min-width: 375px) {
  nav {
    display: flex;
    justify-content: center; }
  .nav-link {
    margin: 0 20px;} }
```



Justifying Content in a Column

Main elements for layout are flex items with the `column` direction.

index.html

HTML

```
<main>
  ...
</main>
```

site.css

CSS

```
main {
  display: flex;
  flex-direction: column;
  justify-content: center; }
```

center of column

start


end



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Level 2 – Section 2

Justification and Order

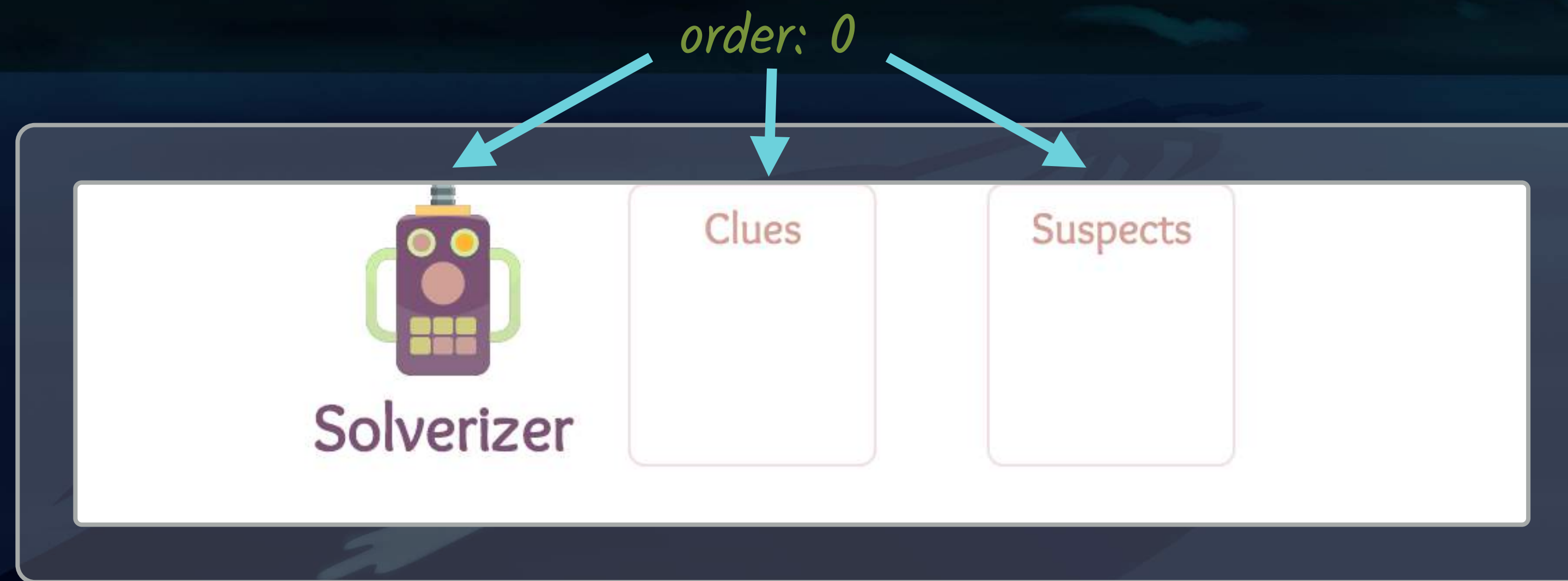
Changing the Order of Items With CSS

Display Position Can Be Changed With CSS



order

order is used to determine the order of flex items along the main axis. It defaults to 0 and accepts positive and negative numbers.



Changing the Order of a Flex Item

Using a negative number displays an item first, based on the `flex-direction`.

index.html

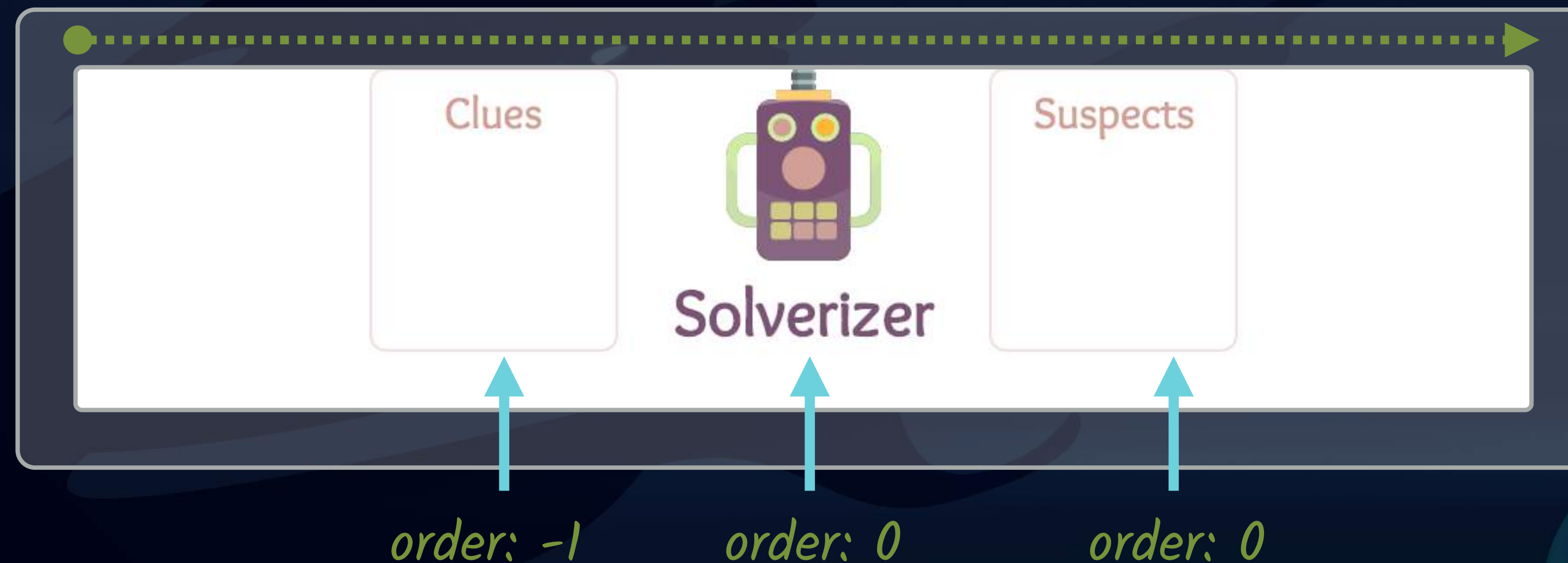
HTML

```
<nav>
  <a class="nav-brand">...
  <a class="nav-clues">...
  <a class="nav-suspects">...
</nav>
```

site.css

CSS

```
@media screen and (min-width: 375px) {
  ...
  .nav-clues {
    order: -1; } }
```



Changing Order of a Flex Item in a Column

Order changes the position of items along the main axis of the column.

index.html

HTML

```
<main>
  <img ...>
  <h1>...</h1>
  <p class="slogan">...</p>
  <a>...</a>
</main>
```

site.css

CSS

```
...
.slogan {
  order: 1;
  margin-top: 10px; }
```

order: 0

order: 0

order: 0

order: 1



Villainr



Meet diabolical co-conspirators

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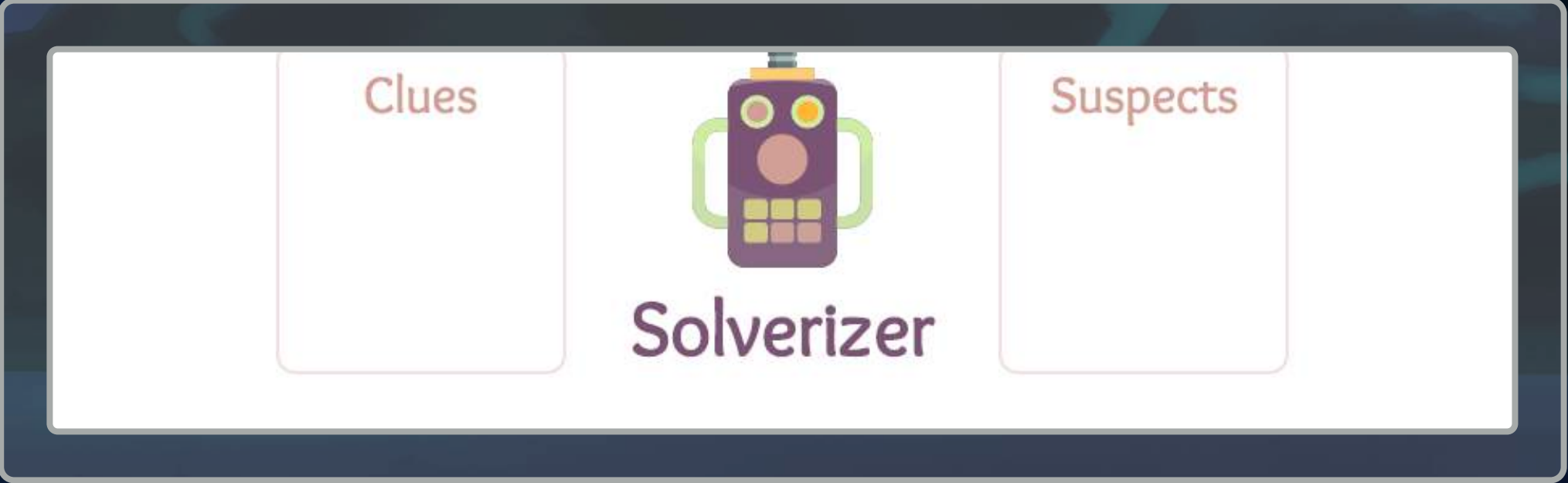
Level 3

Aligning Alibis

Distributing Space Between Items

Distributing Space on the Cross Axis

Before



After



Before



After



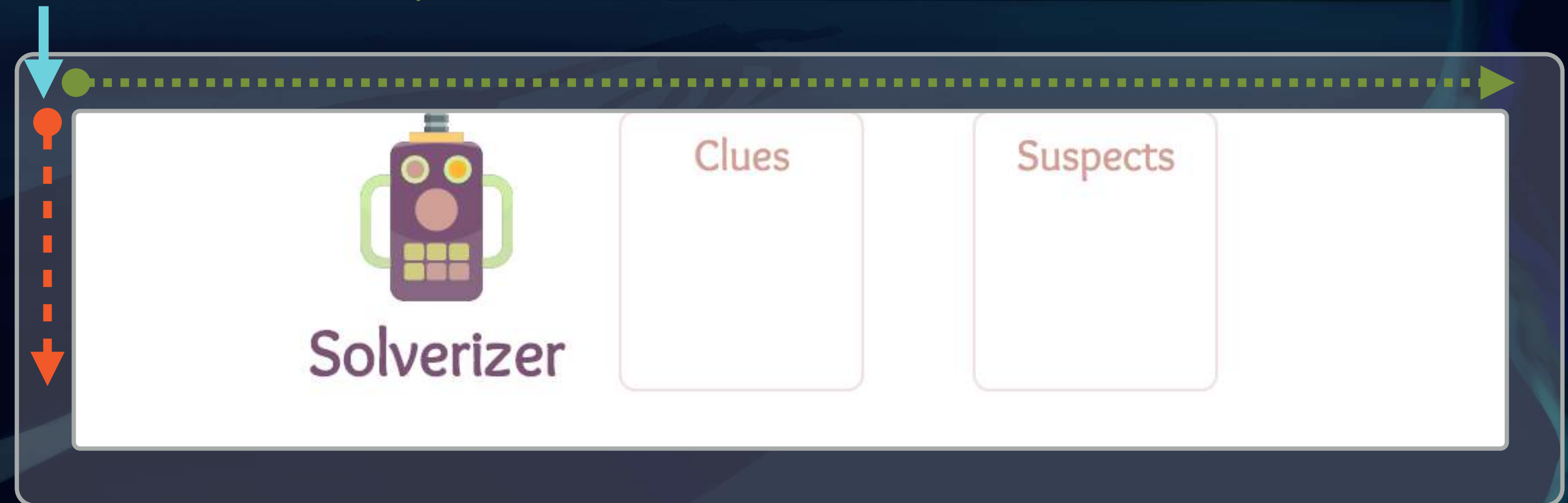
Flex Items Are Aligned Along a Cross Axis

The cross axis is perpendicular to the main axis.



In column direction, the cross axis is horizontal

In row direction, the cross axis is vertical



align-items

Used to align content on the cross axis, the default value is **stretch** and it accepts:
stretch | **flex-start** | **flex-end** | **center** | **baseline**.

index.html

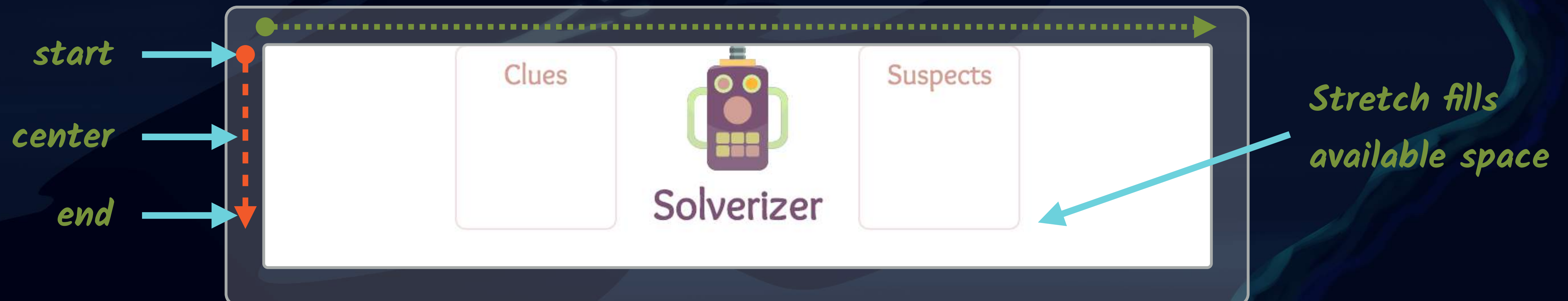
HTML

```
<nav>
  <a class="nav-brand">...
  <a class="nav-clues">...
  <a class="nav-suspects">...
</nav>
```

site.css

CSS

```
@media screen and (min-width: 375px) {
  .nav{
    align-items: stretch;
    display: flex;
    justify-content: center; } }
```



Start and End

site.css

CSS

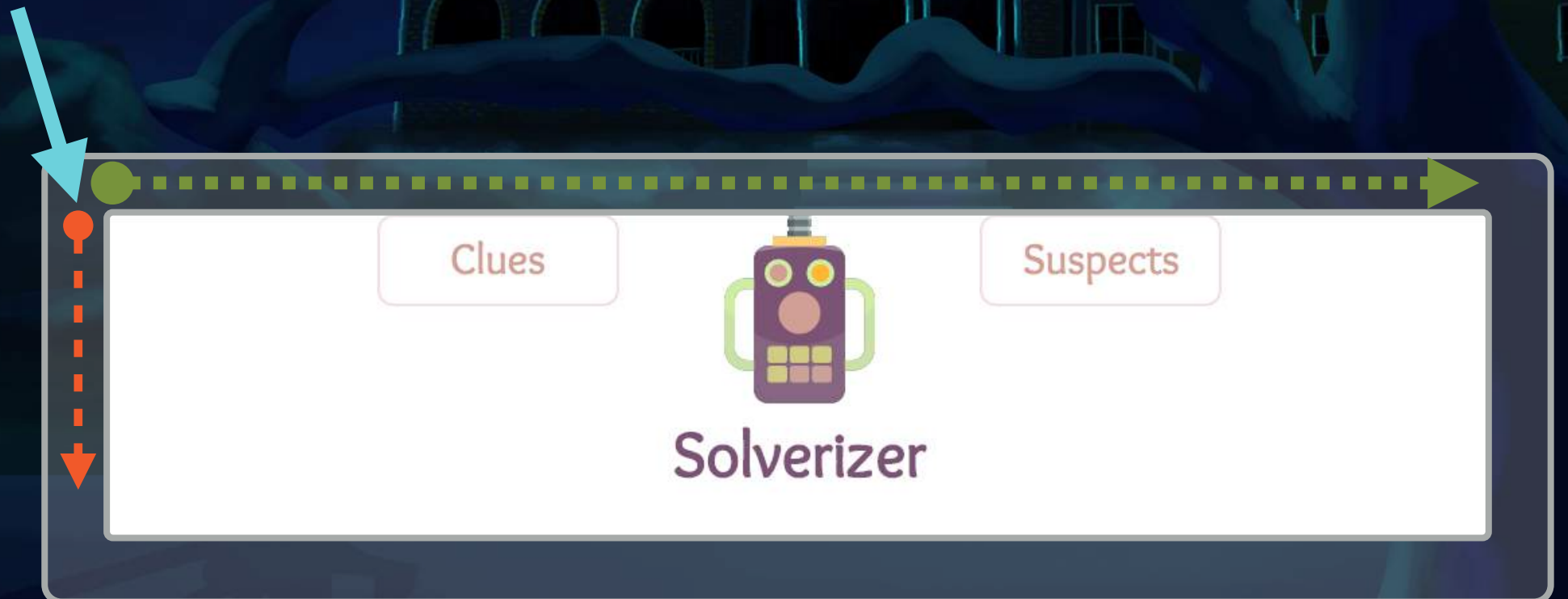
```
@media screen and (min-width: 375px) {  
  .nav{  
    align-items: flex-start;  
    ... } }
```

site.css

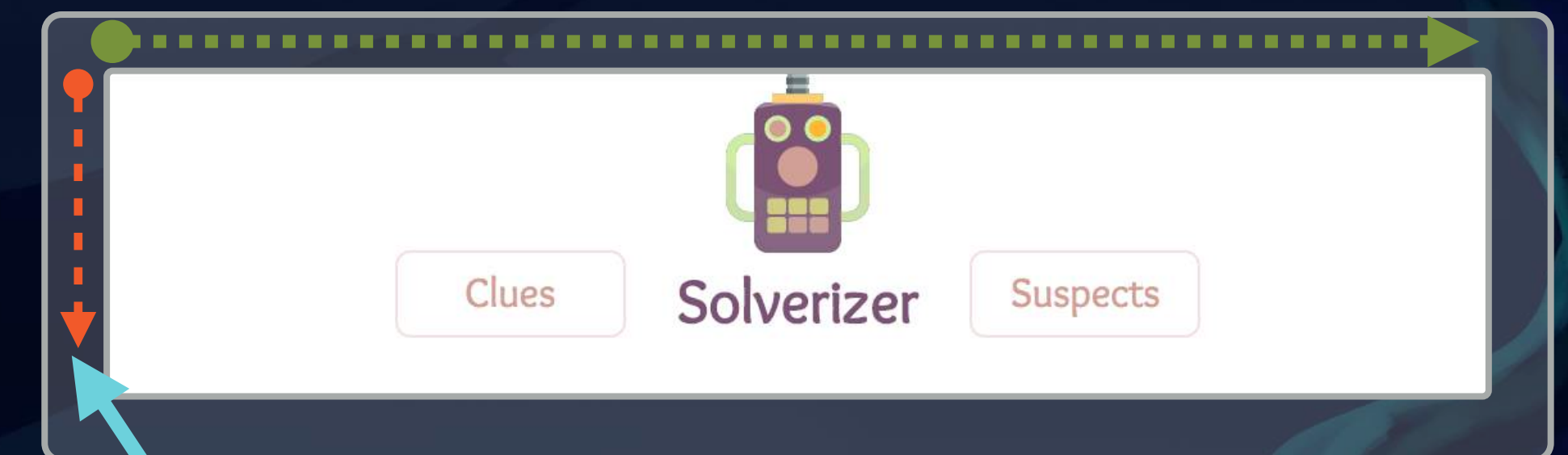
CSS

```
@media screen and (min-width: 375px) {  
  .nav{  
    align-items: flex-end;  
    ... } }
```

start



end



Baseline and Center

site.css

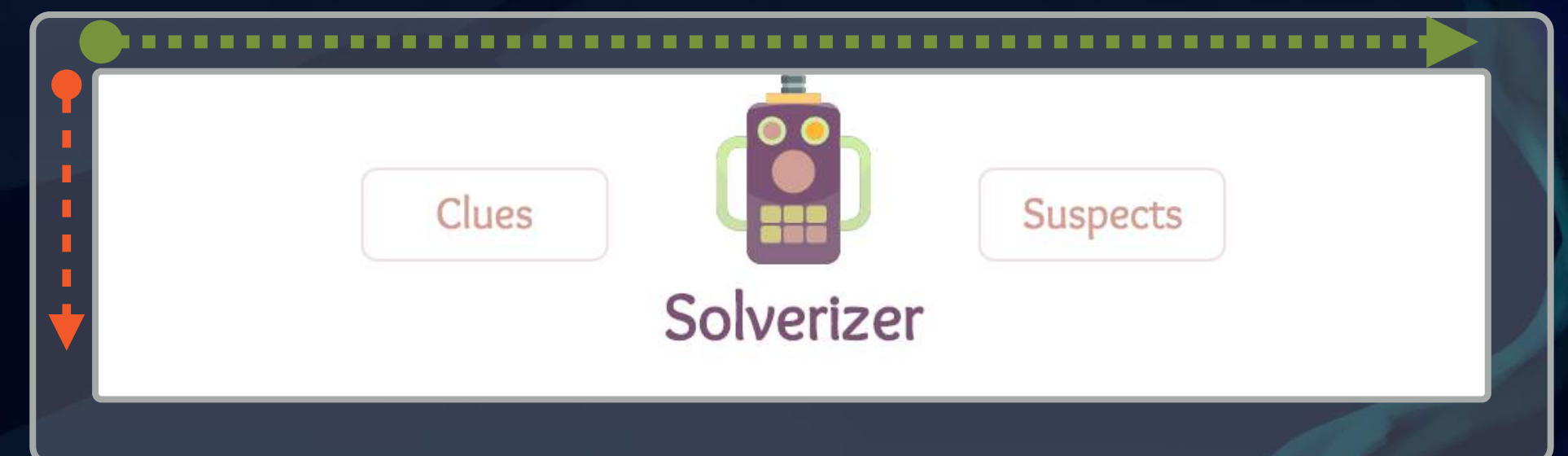
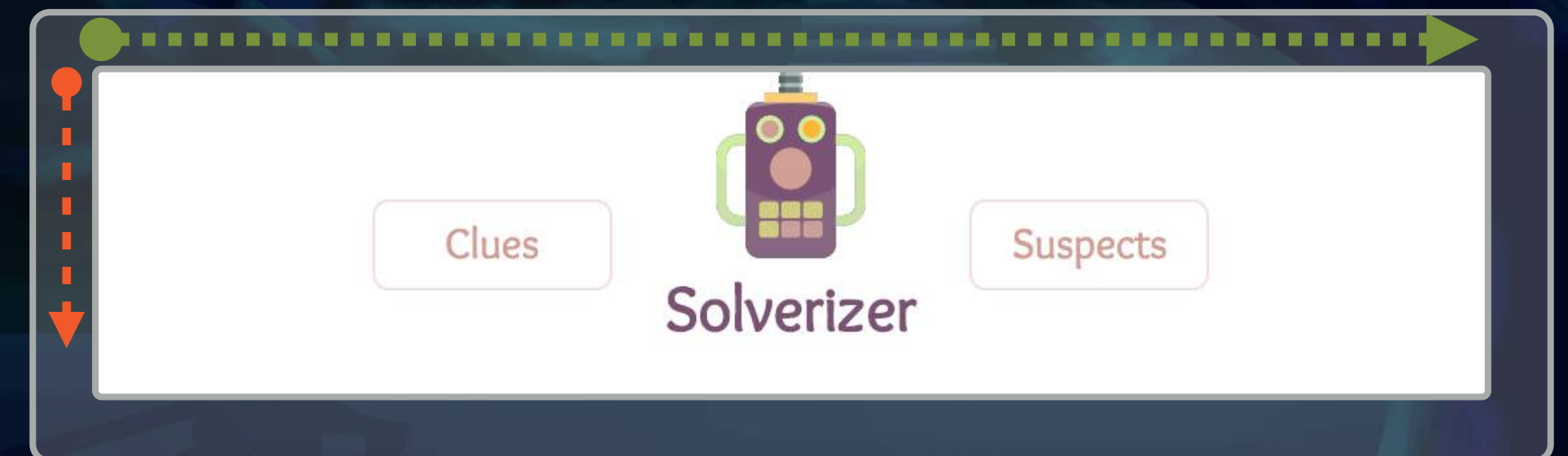
CSS

```
@media screen and (min-width: 375px) {  
  .nav{  
    align-items: baseline;  
    ... } }
```

site.css

CSS

```
@media screen and (min-width: 375px) {  
  .nav{  
    align-items: center;  
    ... } }
```



Aligning Items in Column Direction

Items stretch to fill the width of the container.

index.html

HTML

```
<main>
  ...
</main>
```

site.css

CSS

```
...
main {
  align-items: center;
  ...
}
```


Centered horizontally



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Level 4 – Section 1

Sizing Up the Properties

New Properties for Space-based Size

Examples, Sized With Flex Properties

Stay In the Know

Sign up below to receive updates when new clues are added.





Email

Grow to use available width

Stay In the Know

Sign up below to receive updates when new clues are added.

Email

| | | | |
|---|--|---|---|
|  | <h4>Brown necktie</h4> <p>The neutral tones help its owner blend in with any background — especially the faded wallpaper in the aging haunted house.</p> |  | <h4>Tobacco Pipe</h4> <p>The musty smell of old tobacco wafts from this vintage pipe — which wasn't actually vintage when the owner purchased it new.</p> |
|  | <h4>Gold Pocket Watch</h4> <p>The telltale ticking of this pocket watch echoes throughout the halls of the haunted house, bouncing off sheet-covered furniture... or ghosts.</p> |  | <h4>Cane</h4> <p>There's a dusting of hard-candy sugar along this solid-oak cane, which is ideal for enthusiastic pointing while lecturing whippersnappers.</p> |

Defined widths for items

(Mostly) Default Behavior

index.html

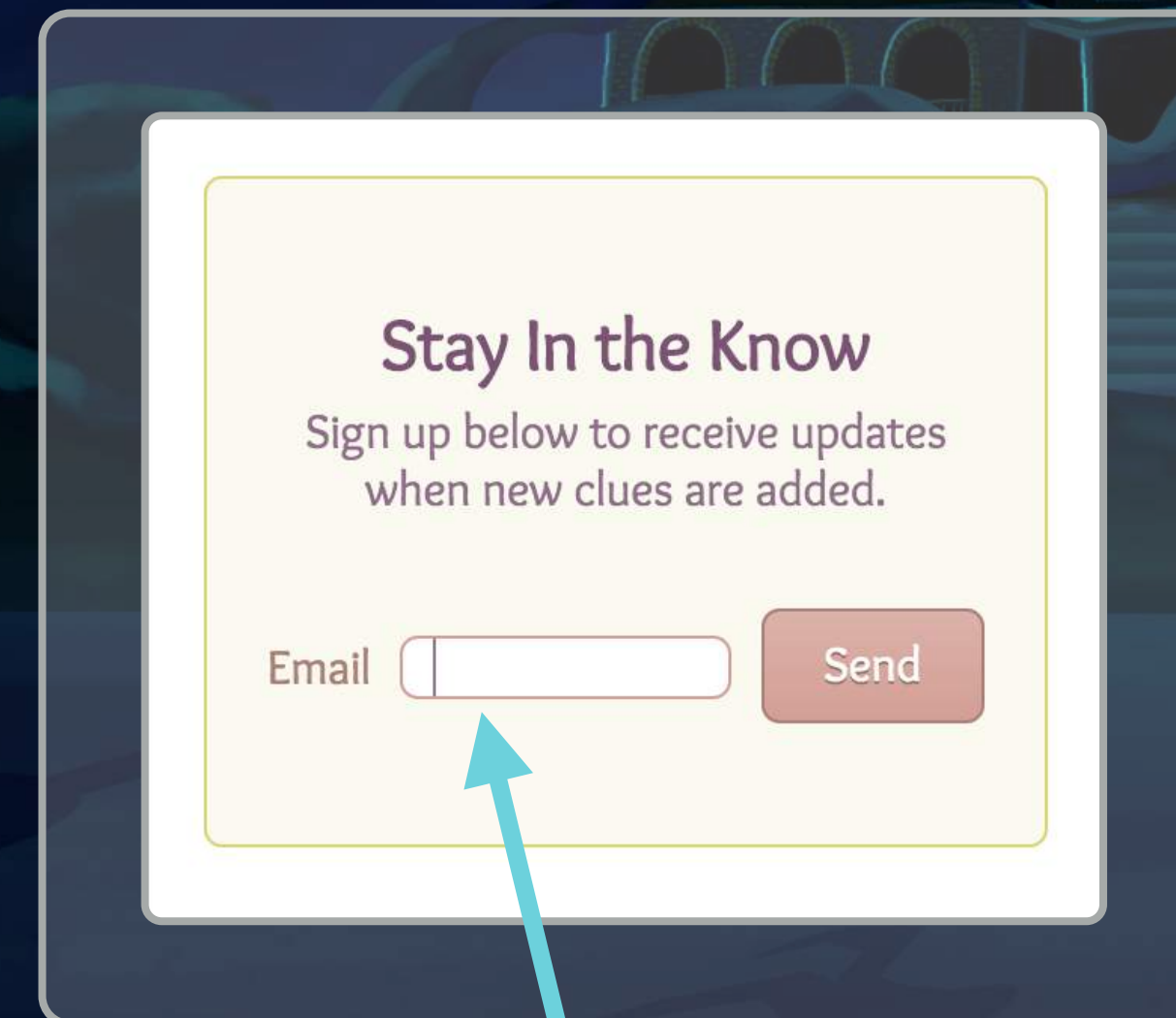
HTML

```
<div ...>
  <label ...>...</label>
  <input class="add-input">
  <button ...>...</button>
</div>
```

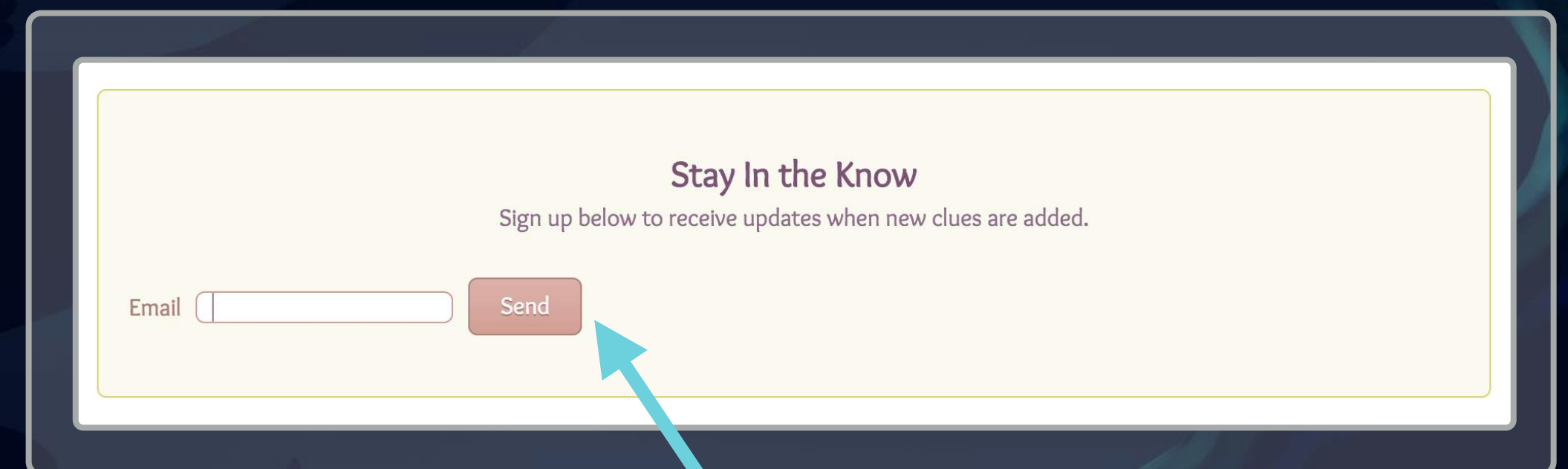
site.css

CSS

```
...
.add-input {
  align-items: center;
  display: flex;
  min-width: 0; }
```



Set min-width to 0



Fills content space

flex-grow

Used to specify the ratio of the space an item should fill in the main axis. It accepts numbers and the default is 0.

index.html

HTML

```
<div ...>
  <label class="add-label">...
  <input class="add-input">
  <button class="add-button">...
</div>
```

site.css

CSS

```
...
.add-label,
.add-input,
.add-button {
  flex-grow: 0; }
```

*Items don't grow
beyond content size*

The diagram shows a form layout within a container. A dashed green line with an arrow at the end indicates the main axis (horizontal). A dashed red line with a downward arrow indicates the cross-axis (vertical). The form contains the following elements: a title 'Stay In the Know', a subtitle 'Sign up below to receive updates when new clues are added.', an 'Email' label, an input field, and a 'Send' button. A blue arrow points from the text 'Items don't grow beyond content size' to the input field, illustrating that the item's size is determined by its content and does not expand to fill the remaining space in the container.

Using flex-grow for a Single Item

Assigning a value of 1 makes an item fill as much space as possible.

index.html

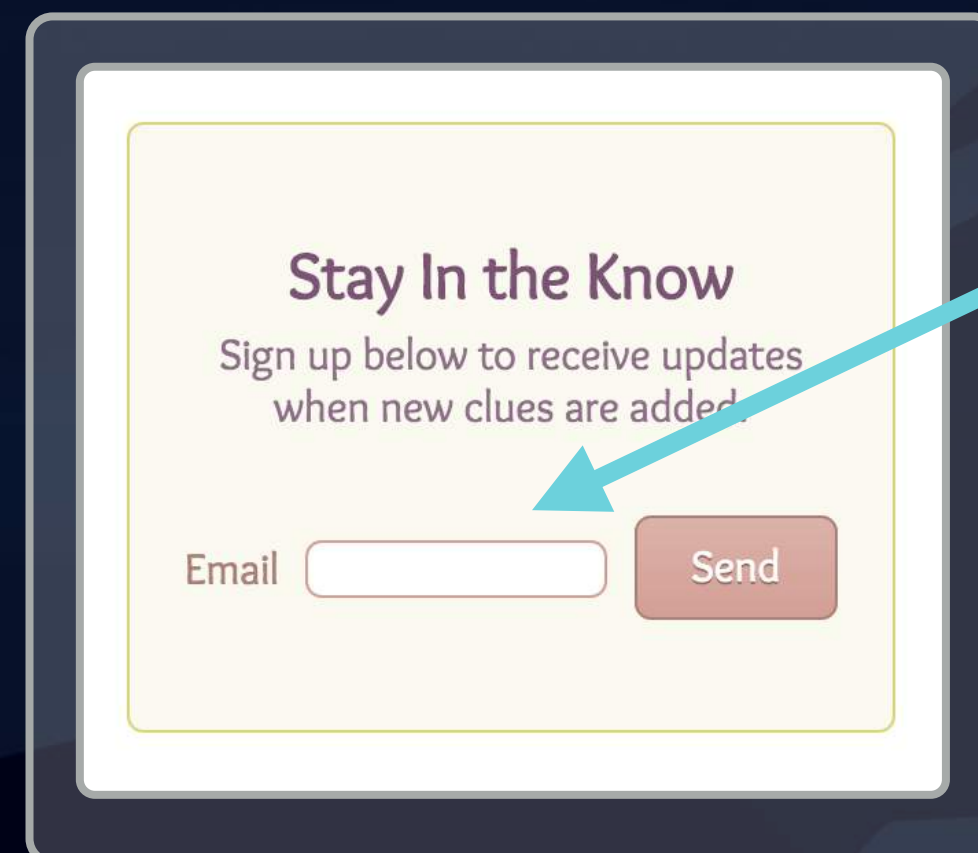
HTML

```
<div ...>
  <label ...>...</label>
  <input class="add-input">
  <button ...>...</button>
</div>
```

site.css

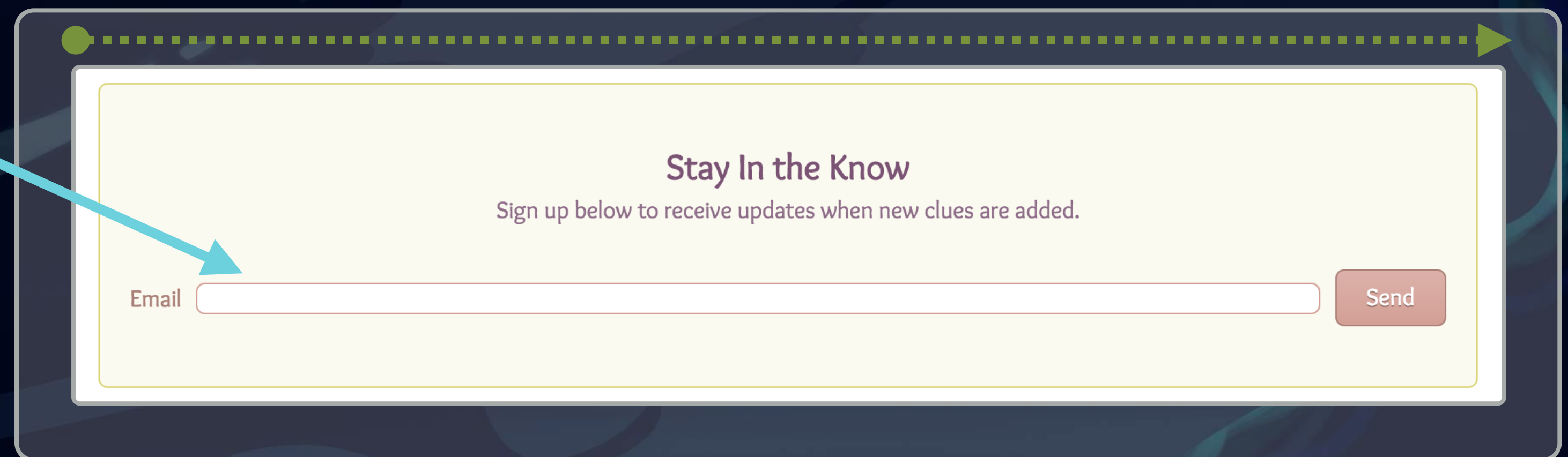
CSS

```
...
.add-input {
  ...
  flex-grow: 1; }
```



A small rectangular form with a yellow border. It contains the text "Stay In the Know" and "Sign up below to receive updates when new clues are added." Below this is a label "Email" followed by a short text input field and a "Send" button.

*Fills all
available
space*



A larger rectangular form with a yellow border, representing the same form as the small one but stretched to fill more space. It contains the text "Stay In the Know" and "Sign up below to receive updates when new clues are added." Below this is a label "Email" followed by a long text input field and a "Send" button. A dashed green arrow points from the text "Fills all available space" to the input field.

Using flex-grow for Multiple Items

Assigning a value of **1** to multiple properties will have them all try to fill as much space as possible.

index.html

HTML

```
<div ...>
  <label class="add-label">...
  <input class="add-input">
  <button class="add-button">...
</div>
```

site.css

CSS

```
...
.add-label,
.add-input,
.add-button {
  flex-grow: 1; }
```

Stay In the Know

Sign up below to receive updates when new clues are added.

Email

Send

*Each item divides
the space*

Using flex-grow With Empty Containers

Empty flex containers will divide the space according to the ratio.

index.html

HTML

```
<div class="one">...</div>
<div class="two">...</div>
<div class="three">...</div>
```

site.css

CSS

```
.one,
.three {
  flex-grow: 1; }
.two {
  flex-grow: 2; }
```

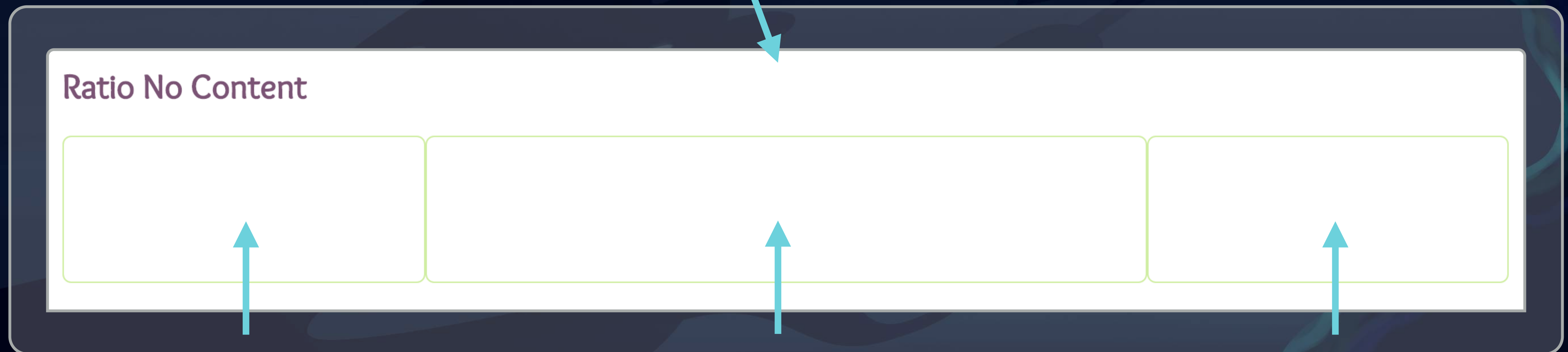
1000px

Ratio No Content

.one, 250px

.two, 500px

.three, 250px



Using flex-grow With Same-sized Content

Content alters how the algorithm divides space.

index.html

HTML

```
<div class="one">Width: 274px</div>  
<div class="two">Width: 452px</div>  
<div class="three">Width: 274px</div>
```

site.css

CSS

```
.one,  
.three {  
  flex-grow: 1; }  
.two {  
  flex-grow: 2; }
```

1000px

Ratio With Content

Width: 274px

Width: 452px

Width: 274px

Using flex-grow With Uneven Content

Content with different widths will affect the ratio size.

index.html

HTML

```
<div class="one">...</div>
<div class="two">...</div>
<div class="three">...</div>
```

site.css

CSS

```
.one,
.three {
  flex-grow: 1; }
.two {
  flex-grow: 2; }
```

1000px

UnEven Content

One Width: 279px

Two Width: 433px

Three Width: 288px

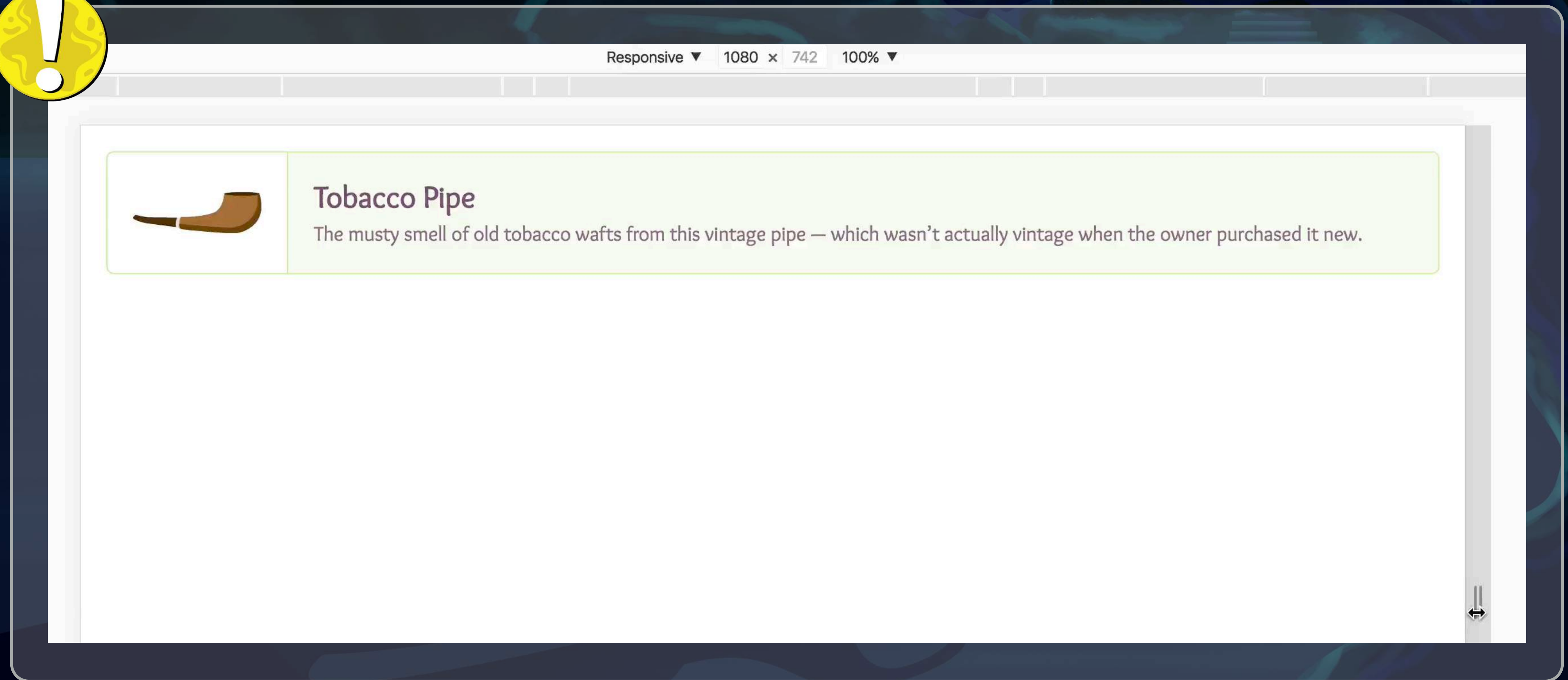
16 characters

16 characters

18 characters

Growing Pains

We want the text item to resize, but not the image.



flex-shrink

Used to specify the "shrink factor" of a flex item. It accepts numbers and the default is 1.

index.html

HTML

```
<article ...>
  <div class="clue-img">...</div>
  <div class="clue-info">...</div>
</article>
```

site.css

CSS

```
...
.clue-img {
  flex-shrink: 0; }
```



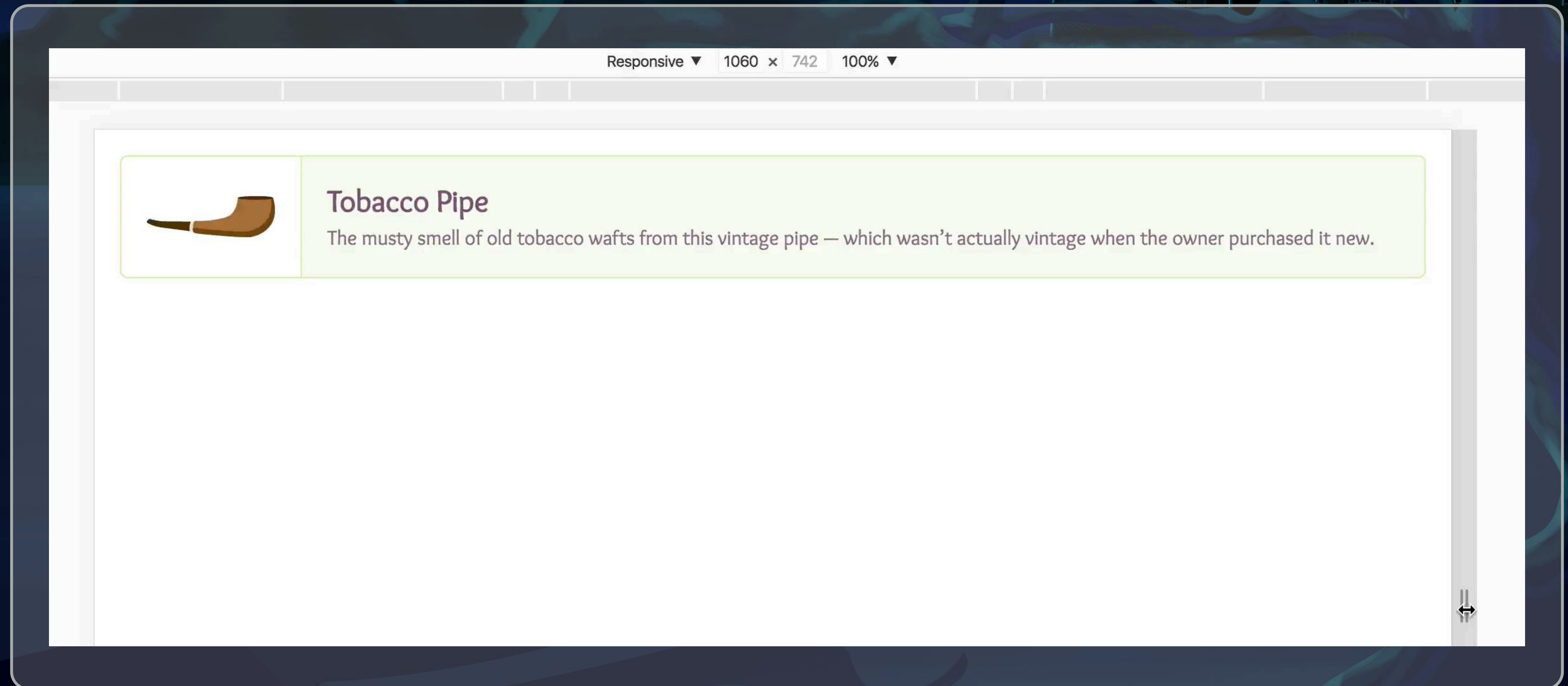
Tobacco Pipe

The musty smell of old tobacco wafts from this vintage pipe — which wasn't actually vintage when the owner purchased it new.

Does not reduce in width

flex-shrink: 0 in Action


The `.clue-img` div remains the same size.



CRACKING
THE CASE WITH

FLEXBOX





Level 4 – Section 2

Sizing Up the Properties

New Property for Setting Width Values

Problem: Defined Widths for Flex Items



Brown necktie
The neutral tones help its owner blend in with any background — especially the faded wallpaper in the aging haunted house.



Tobacco Pipe
The musty smell of old tobacco wafts from this vintage pipe — which wasn't actually vintage when the owner purchased it new.



Gold Pocket Watch
The telltale ticking of this pocket watch echoes throughout the halls of the haunted house, bouncing off sheet-covered furniture... or ghosts.



Cane
There's a dusting of hard-candy sugar along this solid-oak cane, which is ideal for enthusiastic pointing while lecturing whippersnappers.



Brown necktie
The neutral tones help its owner blend in with any background — especially the faded wallpaper in the aging haunted house.



Tobacco Pipe
The musty smell of old tobacco wafts from this vintage pipe — which wasn't actually vintage when the owner purchased it new.



Gold Pocket Watch
The telltale ticking of this pocket watch echoes throughout the halls of the haunted house, bouncing off sheet-covered furniture... or ghosts.



Cane
There's a dusting of hard-candy sugar along this solid-oak cane, which is ideal for enthusiastic pointing while lecturing whippersnappers.

Consistent widths

flex-basis

Used to specify the initial size of a flex item. It defaults to `auto` and currently supports CSS units: `%`, `px`, `em`, `rem`, etc.

index.html

HTML

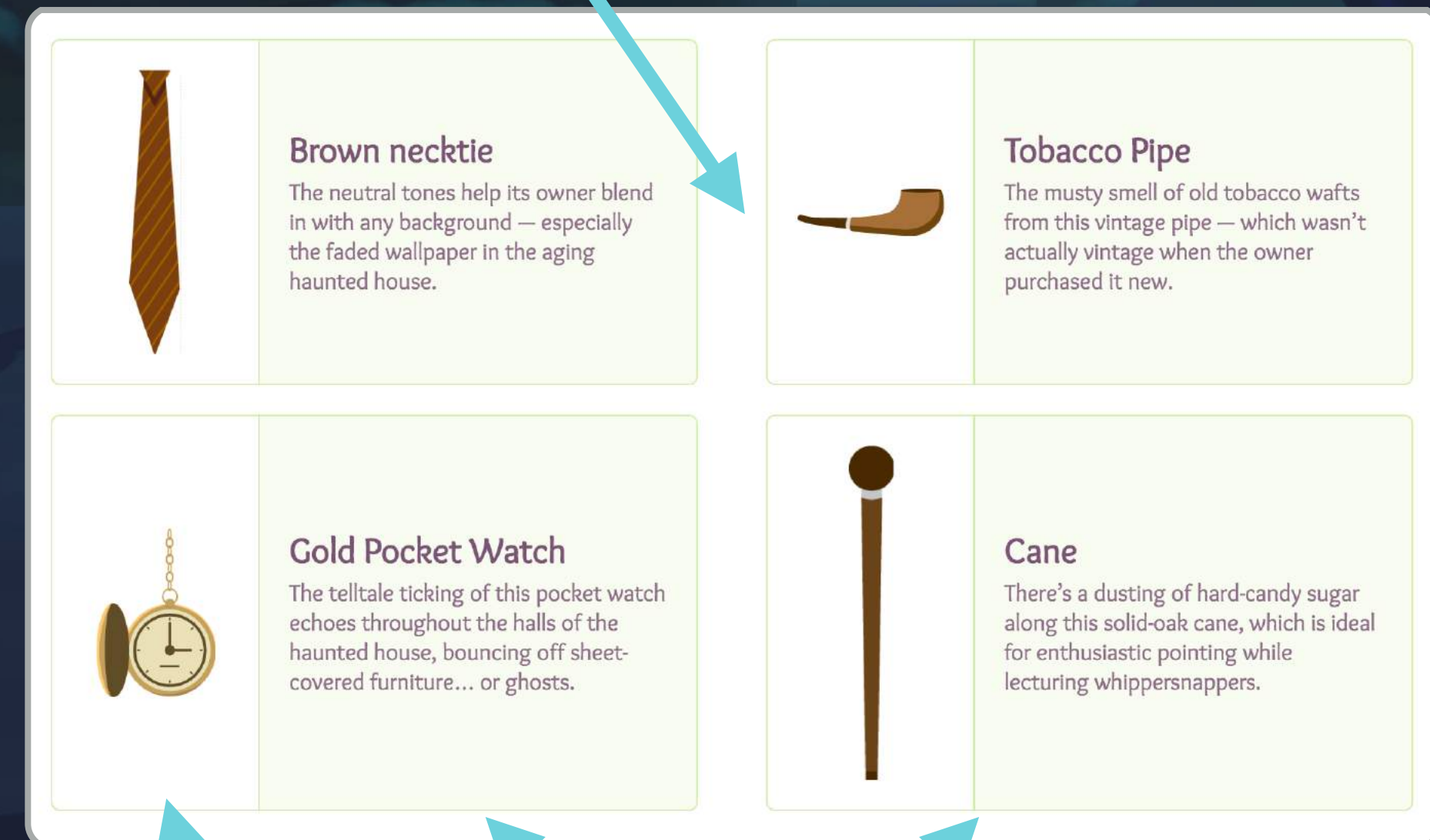
```
<article class="clue">
  <div class="clue-img">...</div>
  <div class="clue-info">...</div>
</article>
```

site.css

CSS

```
...
.clue{
  flex-basis: 47.5%; }
.clue-img {
  flex-basis: 140px; }
```

justify-content: space-between

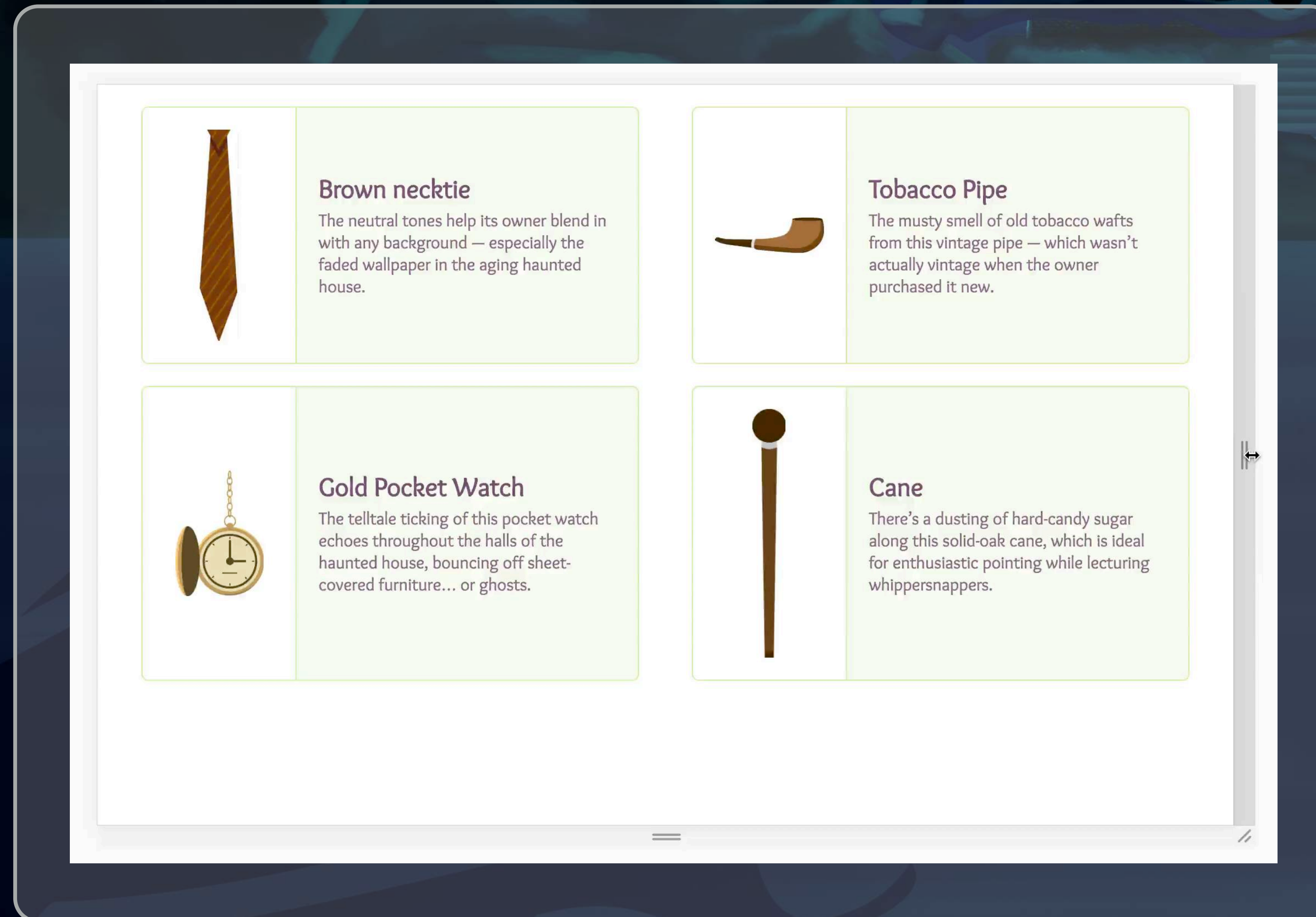


140px

47.5%

Combining flex-basis and flex-shrink

With one item set to a pixel-based value, the other will adjust to fill the remaining space.



Using flex-basis and Absolute Units

Items with a `flex-basis` that is an absolute unit will not grow beyond the value by default.

site.css

CSS

```
div {  
  flex-basis: 250px; }
```

Pixel



The flex container is 1166px

Using flex-basis and relative units

Items with a relative flex-basis will grow to fill the space.

Percentage

Width: 290px

Width: 290px

Width: 290px

Width: 290px

Pixel with flex-grow: 1

One Width: 290px

Two Width: 290px

Three Width: 290px

Four Width: 290px

More flex-basis Properties — Maybe!

There are more properties that are proposed but not currently implemented in browsers.



```
/* Intrinsic sizing keywords */  
flex-basis: fill;  
flex-basis: max-content;  
flex-basis: min-content;  
flex-basis: fit-content;  
  
/* Automatically size based on the flex item's content */  
flex-basis: content;
```


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Level 5 – Section 1

Property Plotting

Aligning Content in Edge Cases

Our Layouts Could Use Some Polish

Stay In the Know

Sign up below to receive updates when new clues are added.

Email

Send

Can we make the heights match?

How can we center this?

Villainr



Nameson McNamerson

How bad this person is and who they are bad to.



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align-self

Used to align individual flex items by overriding the `align-items` value. The default value is `stretch` and it accepts: `stretch` | `flex-start` | `flex-end` | `center` | `baseline`.

index.html

HTML

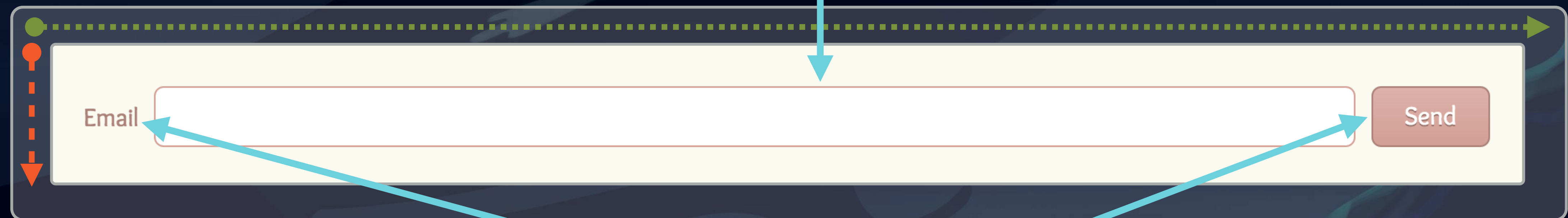
```
<div class="fieldset">
  <label ...>...</label>
  <input class="add-input">
  <button ...>...</button>
</div>
```

site.css

CSS

```
.fieldset{
  align-items: center;
  display: flex; }
.add-input {
  align-self: stretch; }
```

Stretch on the cross axis



Center on the cross axis

Using align-self in a Flex Column

index.html

HTML

```
<body ...>
  <header>...<header>
  <main>...</main>
  <footer>...<footer>
</body>
```

site.css

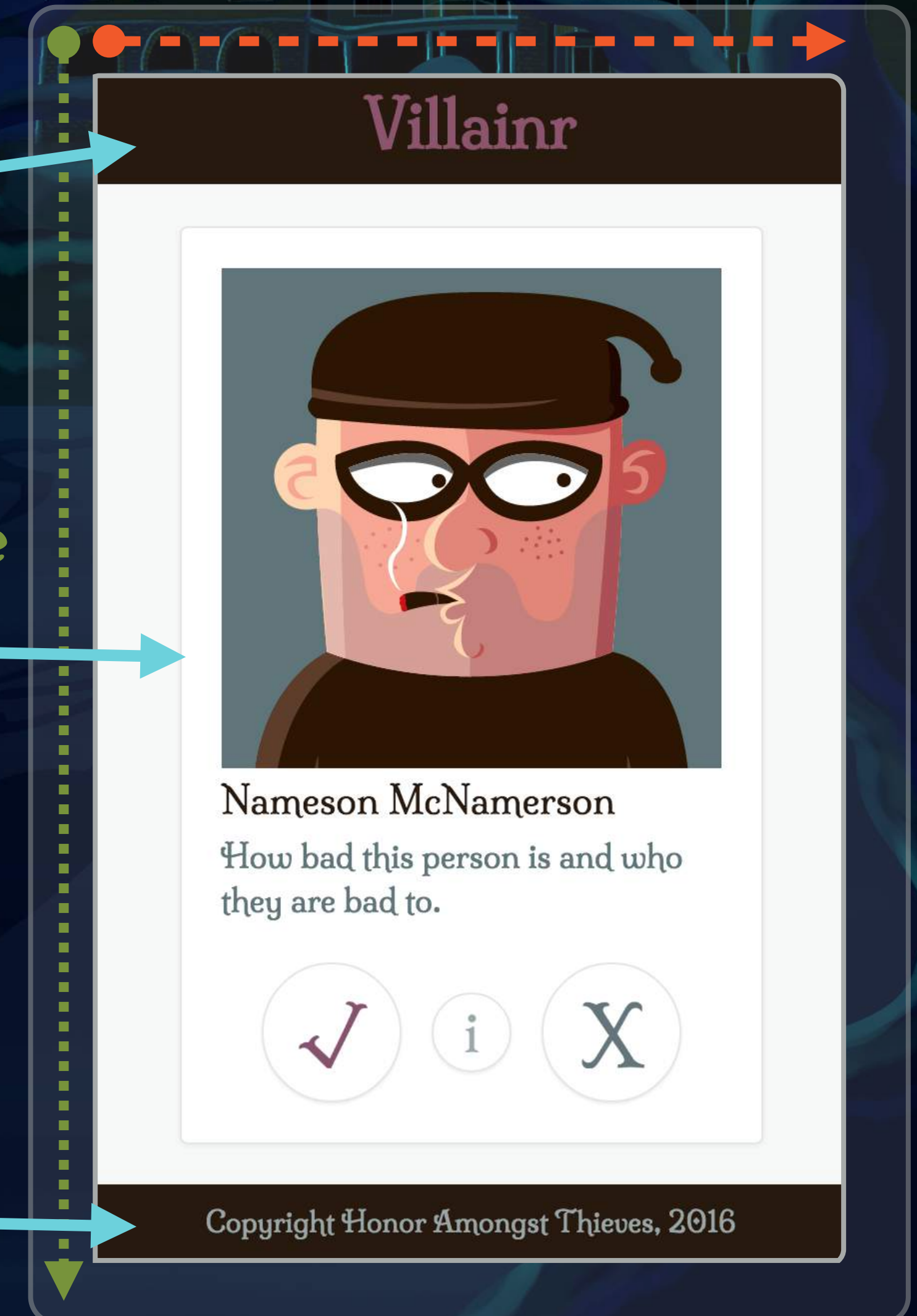
CSS

```
body {
  ...
  align-items: stretch; }
main {
  align-self: center;
  ... }
```

Stretch in the
cross axis

Center in the
cross axis

Stretch in the
cross axis



Controlling Page Layout With flex-wrap

index.html

HTML

```
<body ...>
  <header>...<header>
  <main>...</main>
  <footer>...<footer>
</body>
```

site.css

CSS

```
body {
  ...
  flex-wrap: wrap;
header, footer {
  ...
  flex-basis: 100%;
}
```

*Each item
defaults to
stretch*



align-items Doesn't Control Wrapped Items

index.html

HTML

```
<body ...>
  <header>...<header>
  <main>...</main>
  <footer>...<footer>
</body>
```

site.css

CSS

```
body {
  ...
  align-items: space-between;
  flex-wrap: wrap; }
header, footer {
  ...
  flex-basis: 100%; }
```

No change?!



align-content

Used to align wrapped flex items. The default value is **stretch** and it accepts: **stretch** | **flex-start** | **flex-end** | **center** | **space-between** | **space-around**.

index.html

HTML

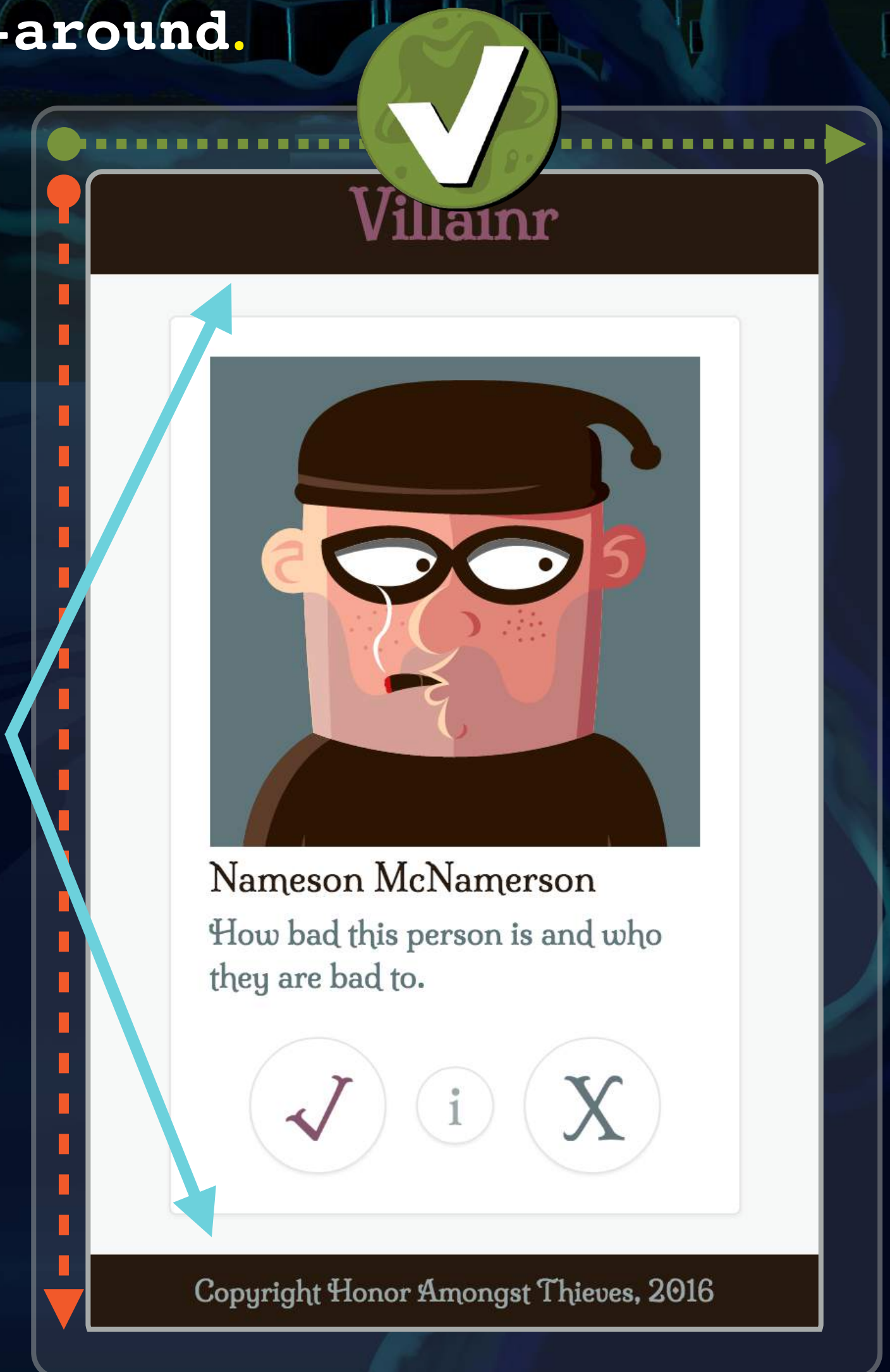
```
<body ...>
...</body>
```

site.css

CSS

```
body {
  ...
  align-content: space-between;
  flex-wrap: wrap; }
header, footer {
  ...
  flex-basis: 100%; }
```


Space between



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Level 5 – Section 2

Property Plotting

Grouping Multiple Properties Into a Single Property

flex

Shorthand property used to set values for `flex-grow`, `flex-shrink`, and `flex-basis`. The default is: `0 1 auto`.

site.css

CSS

```
.flex-item {  
  flex-grow: 0;  
  flex-shrink: 1;  
  flex-basis: auto; }
```

site.css

CSS

```
.flex {  
  flex: 0 1 auto; }
```

grow shrink basis

**If you have to support older IE, you may want to avoid shorthand.*

More, Shorter Examples

Single number assigns the grow value

site.css

CSS

```
.flex-item {  
  flex-grow: 1;  
  flex-shrink: 1; /* Default */  
  flex-basis: auto; } /* Default */
```

site.css

CSS

```
.flex {  
  flex: 1; }
```

Two numbers assigns the grow, shrink values

site.css

CSS

```
.flex-item {  
  flex-grow: 1;  
  flex-shrink: 0;  
  flex-basis: auto; } /* Default */
```

site.css

CSS

```
.flex {  
  flex: 1 0; }
```


More, Short Examples

Single number and percentage assigns the `grow` and `basis` values

site.css

CSS

```
.flex-item {  
  flex-grow: 1;  
  flex-shrink: 1; /* Default */  
  flex-basis: 47.5%; }  

```

site.css

CSS

```
.flex {  
  flex: 1 47.5%; }  

```

None sets `shrink` value, removing flex behavior

site.css

CSS

```
.flex-item {  
  flex-grow: 0; /* Default */  
  flex-shrink: 0;  
  flex-basis: auto; } /* Default */  

```

site.css

CSS

```
.flex {  
  flex: none; }  

```


flex-flow

Shorthand property used to set values for `flex-direction` and `flex-wrap`. The default is: `row nowrap`.

site.css

CSS

```
.flex-item {  
  flex-direction: row; /* Default */  
  flex-wrap: nowrap; } /* Default */
```

site.css

CSS

```
.flex {  
  flex-flow: row nowrap; }
```

direction

wrap

flex-flow Examples

Single direction value sets the **direction** and defaults to **wrap**

site.css

CSS

```
.flex-item {  
  flex-direction: column;  
  flex-wrap: nowrap; } /* Default */
```

site.css

CSS

```
.flex {  
  flex-flow: column; }
```

Single wrap value sets the **wrap** and defaults to **row**

site.css

CSS

```
.flex-item {  
  flex-direction: row; /* Default */  
  flex-wrap: wrap; }
```

site.css

CSS

```
.flex {  
  flex-flow: wrap; }
```


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