Hello everyone. Thank you for coming!

When I did this talk a few weeks ago at GDC, I had to cram it all into 25 minutes.
Buuuuut, my first real draft was 45 minutes long.
I spent a few weeks trimming it back to 25 minutes and my delivery had to be pretty fast.

I’m happy to be here today to give you what I’m calling the director’s cut which has several cut examples and tips.

I can also talk at a slower pace which is good for you.

At GDC, people couldn’t keep up and stopped taking notes and just let the firehouse of information just hit them in the face.

So let’s get started!

My name is David Shaver, and I'm a Game Designer at Naughty Dog.

Before that, I was at Respawn Entertainment, Schell Games, and Zynga.

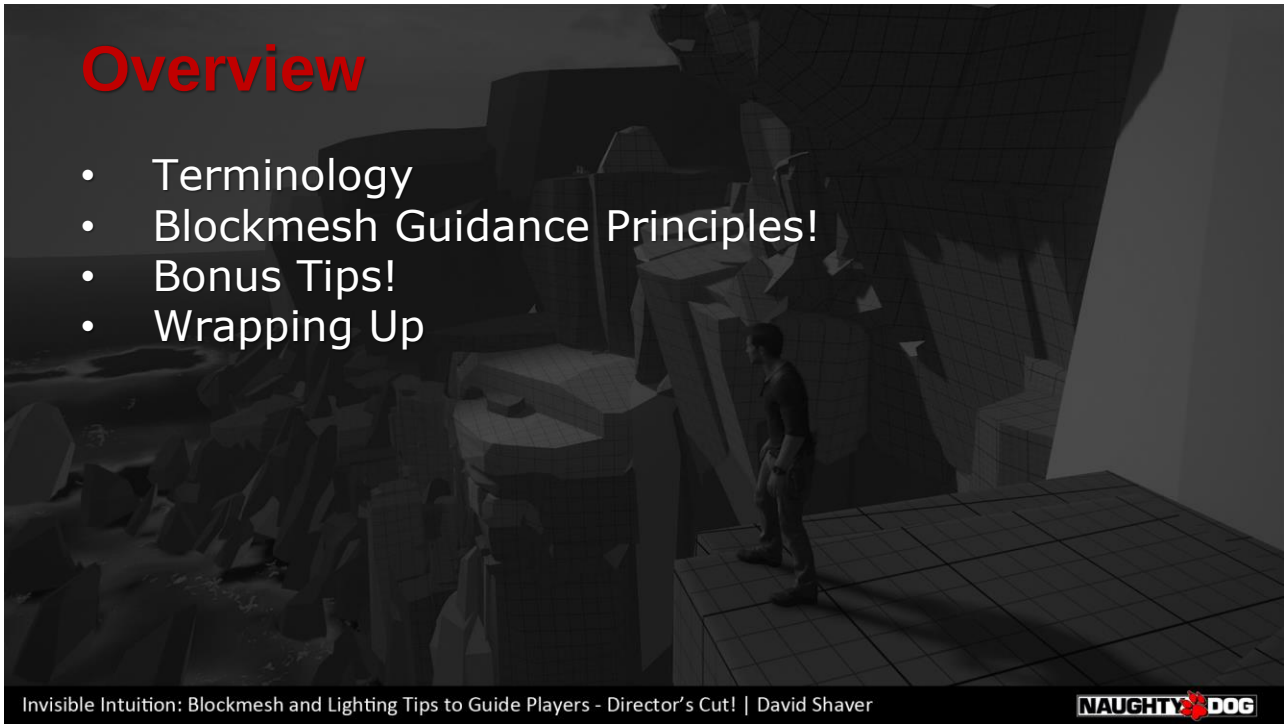
I've been in the industry for almost 11 years and worked on lots of different games - the most recent you can see here.

I started out as a game programmer, and switched to game and level design.

Years ago, the GDC Level Design Workshop helped me realize my love of design and helped with that transition.

This talk is about how to guide players naturally with your level layout to minimize the reliance on HUD markers, forced camera moves, and so on.

It's the talk I wish someone had given to me years ago, because it would have saved a lot of time!



Here's an overview of what I'll be covering today.

First up, let's all get on the same page.

So what the heck is “blockmesh?”

Well, at Naughty Dog, we call levels built with simple geometry and textures, “blockmesh.”

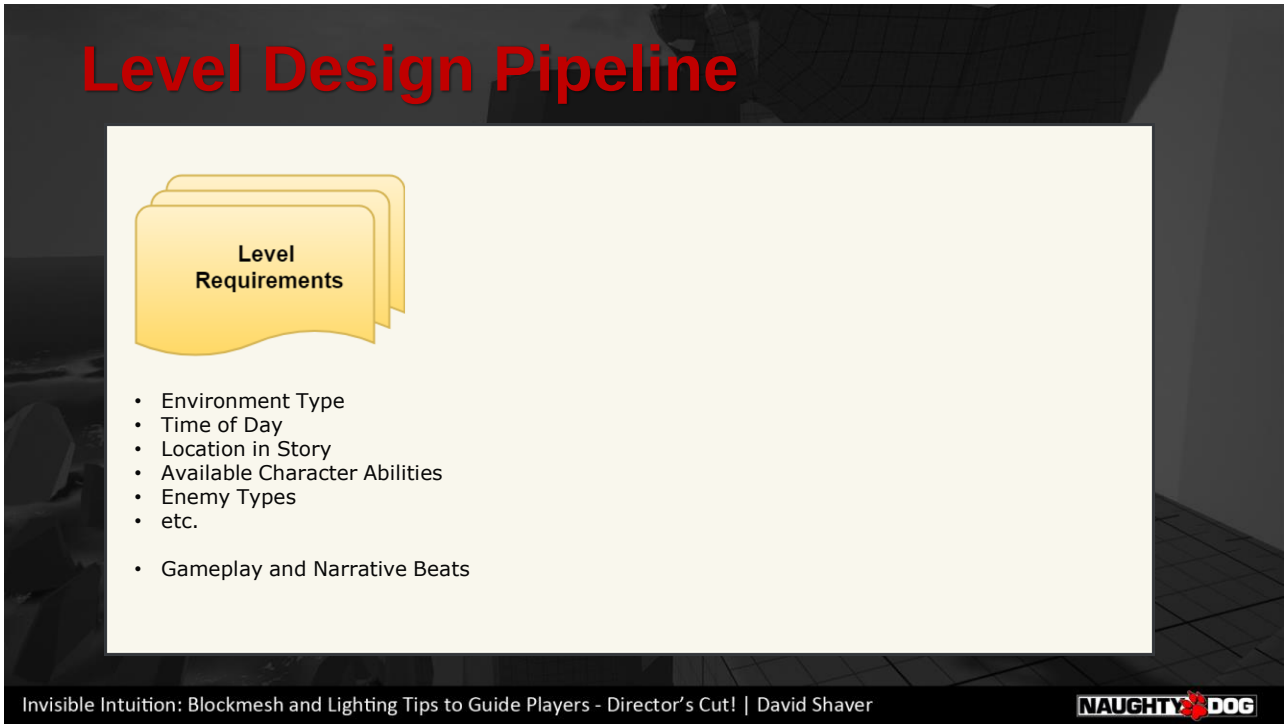
Unfortunately, our industry hasn’t arrived at a single term for this yet. It’s also called greybox, whitebox, and more.

Mostly, I prefer blockmesh because it includes color and lighting which are very important when playtesting layouts since they help guide players.

Also, handing off colored blockmeshes to your artists make it easier to communicate the kinds of textures and colors you had in mind. Green floor? Probably grass. Brown? Probably dirt. And so on.

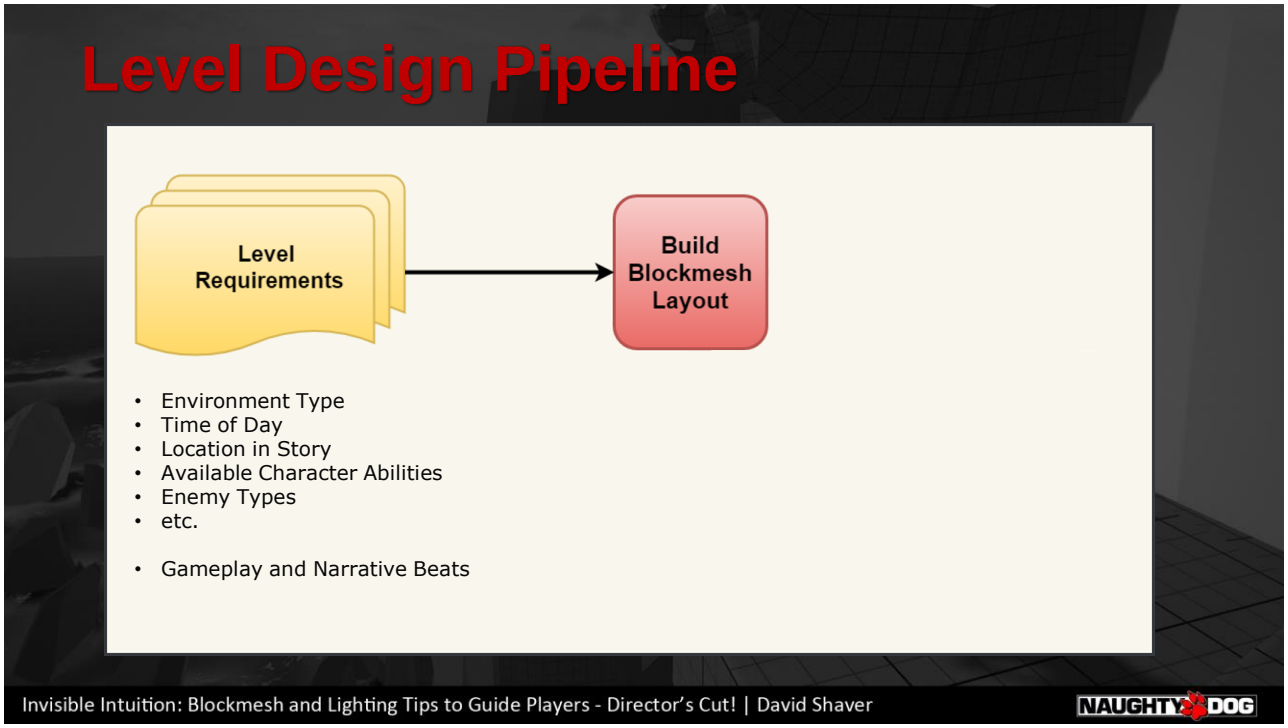
Next let's look at a common level design process at a game studio.

First, you need to establish the context and constraints of your level.



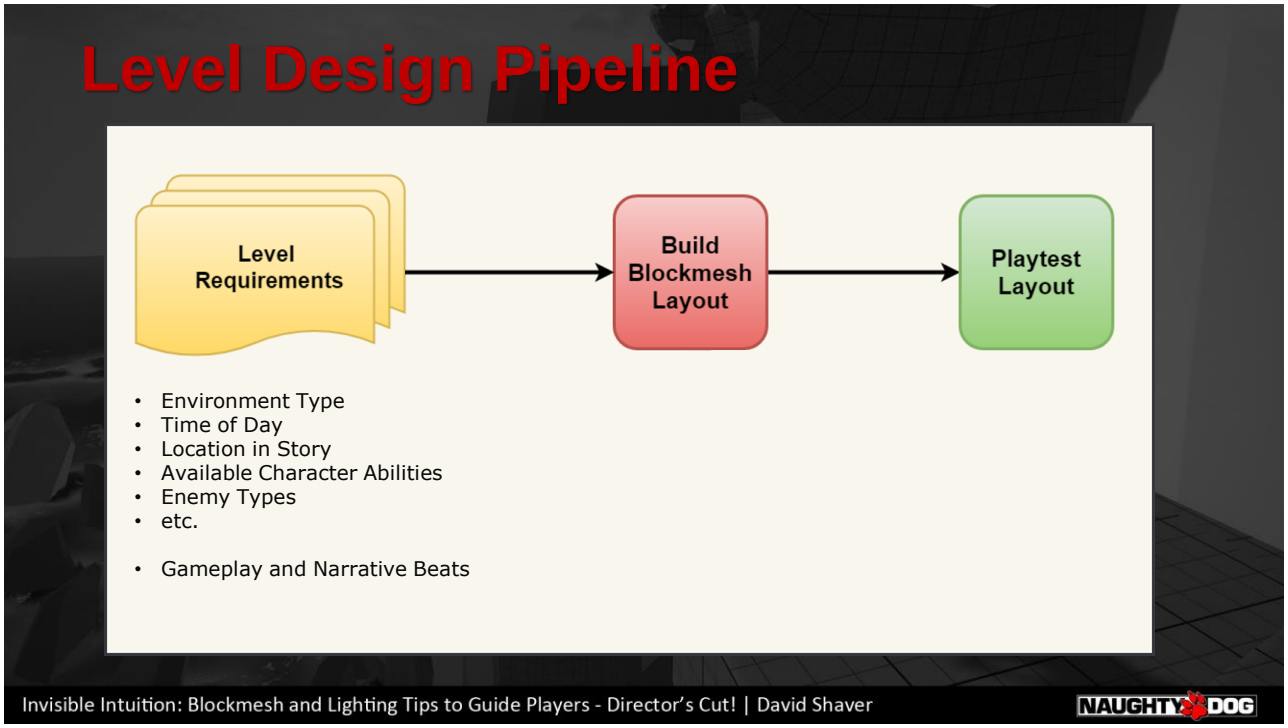
This includes things like environment type, time of day, location in the story, available character abilities, enemies types, etc.

You should decide on the gameplay and narrative beats too.



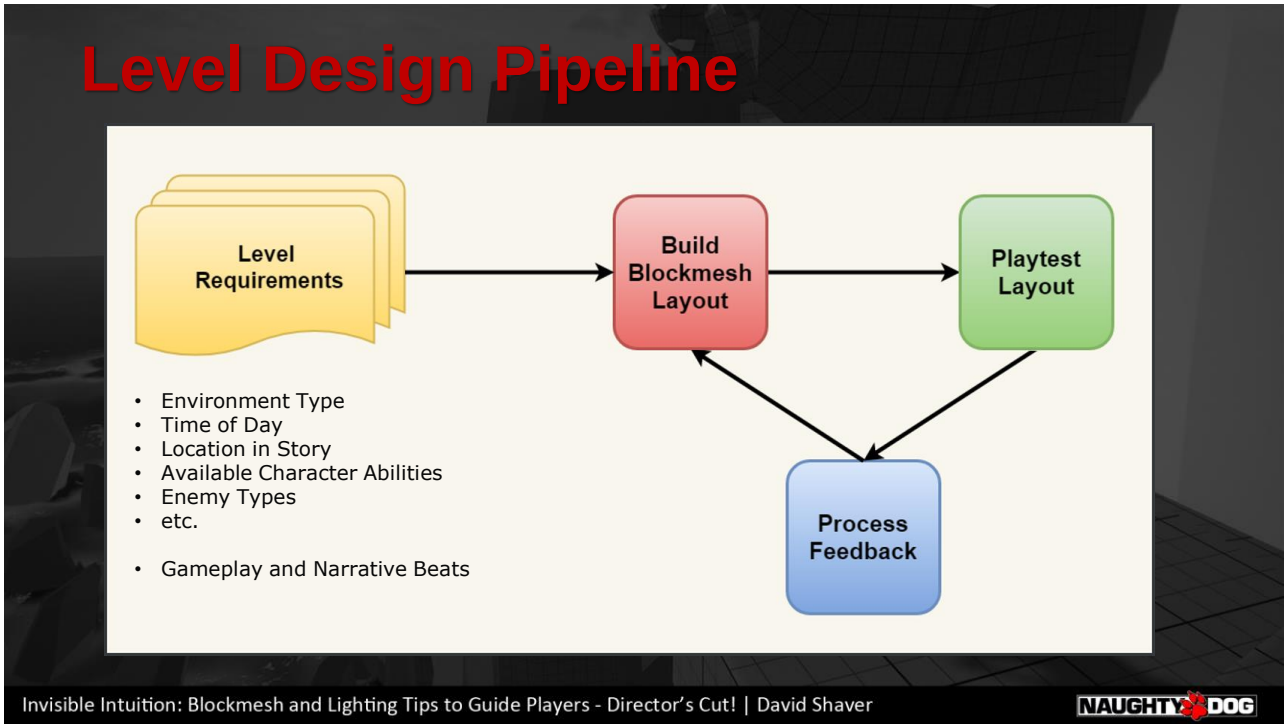
Once you have your requirements and beats, dive right into building a rough version of the entire level so you can get a sense of pacing and scale.

Be sure to stub in those gameplay and narrative beats too.



Get something playable quickly, and then watch other people play it.

No need for formal playtests – just grab anybody.



The feedback you get from them will change your Blockmesh.

Repeat this iteration loop until you…basically run out of time.

And once you run out of time, your layout is locked and handed off to the rest of the team to make it look amazing.

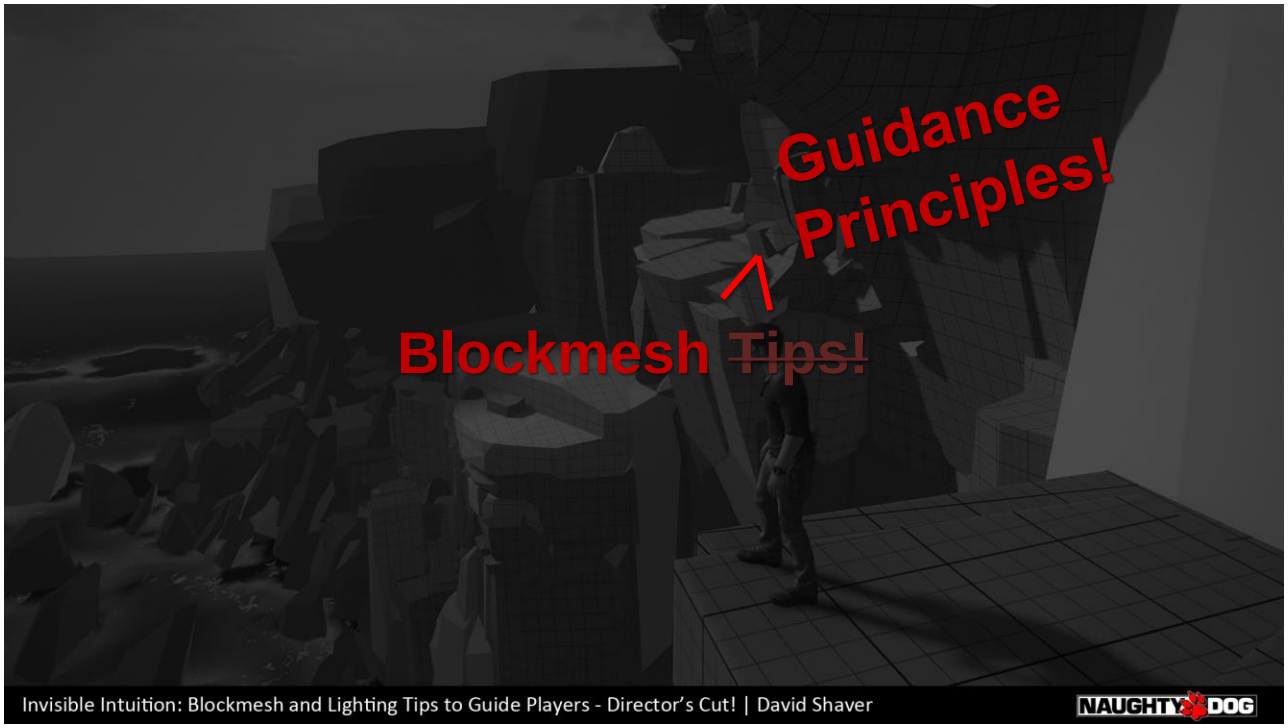
But your job isn't done yet! Your task at this stage is to ensure YOUR design goals mesh with THEIR artistic goals.

Keep playtesting, and work with your artists to ensure it still plays great with real art.

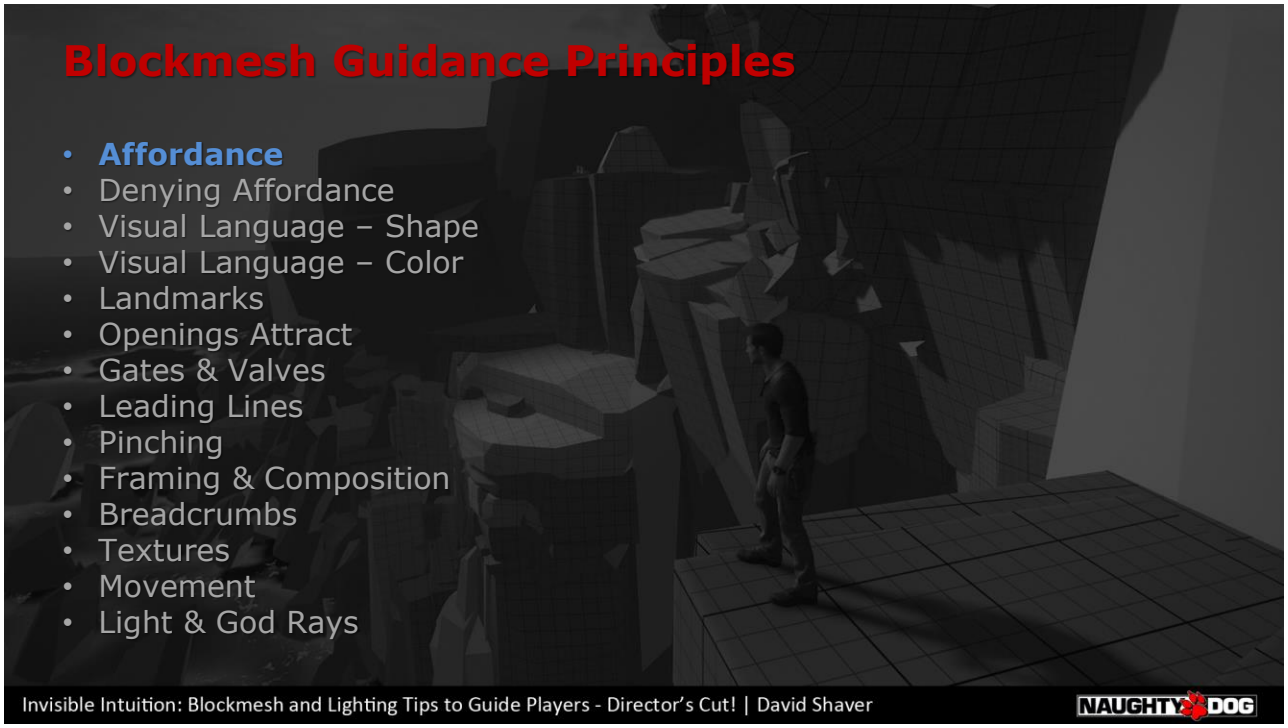
It's worth noting that every studio has a different process, but this core iteration loop is universal.

Now it's time for Blockmesh Tips…

Our game director, Kurt, told me that "tips" wasn't a strong enough word for how important these are so I'm going to rename them now to…



Guidance Principles!



First up, we have affordance.

One of the most powerful ways to guide players is by using affordances, which are "

A classic example is a door handle.

Just by looking at a push bar or a pull handle, you intuit whether to push or pull the door as you approach it.

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: Derek Chatwood

Ladders afford climbing.

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: James Cooper

Edges also afford climbing.

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: Derek Chatwood

Ramps afford jumping off…or…

…smashing through a vent in Wolfenstein 2.

Affordances depend on your game rules because that’s what they’re communicating to the player.

Affordances can also be on interactive props as well as the in environment.

Here, one side of the cart has a handlebar, and one side does not.

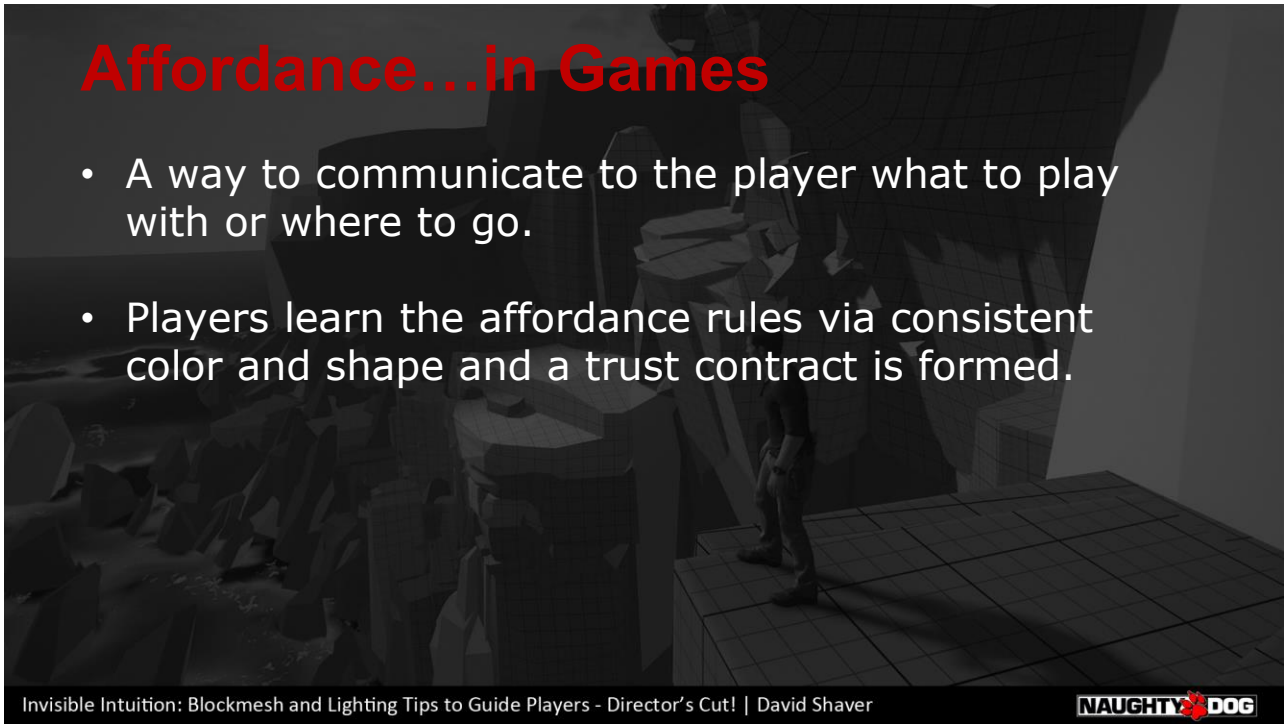
Also, the bar looks long enough to afford two people pushing it, so we had Nadine help.

The color is also white – consistent with many interactive things in the game.
We'll get more into color in a few minutes.

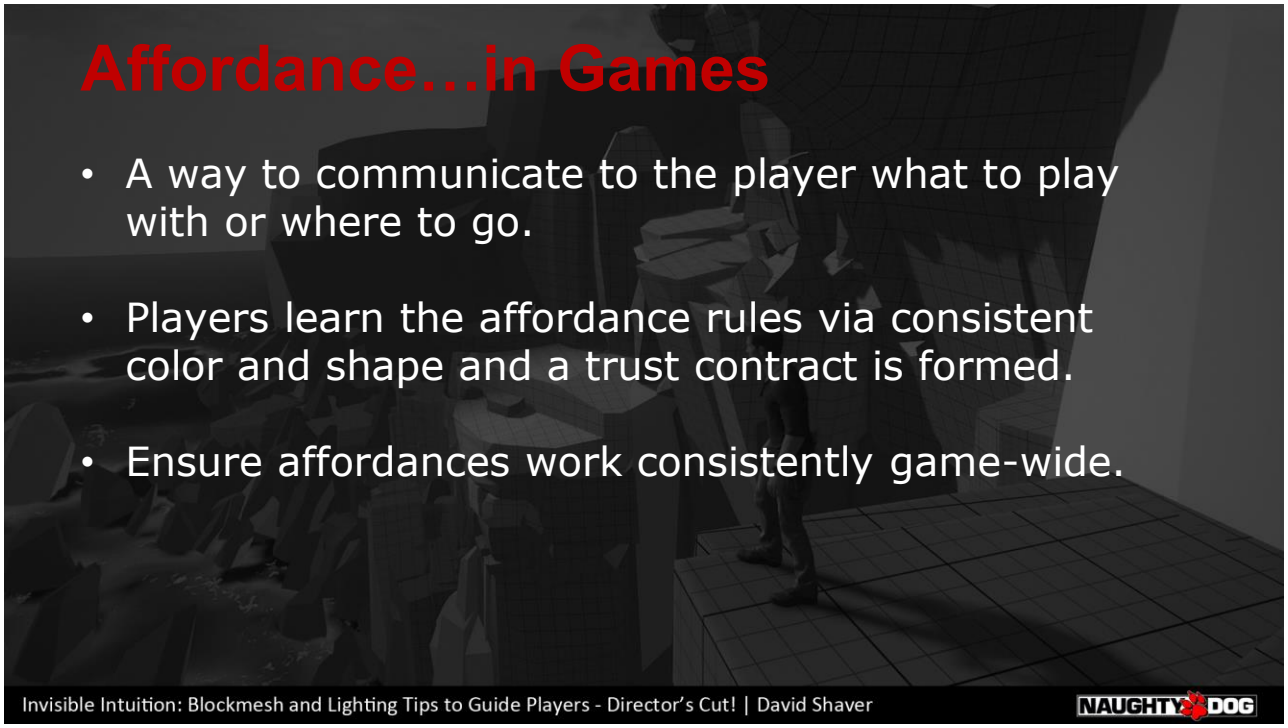
Having the bar on one side was intentional because Sam jumps to the non-handlebar side and the player would be in the way if they were on it.

So, for game designers, affordance is a great way to communicate to the player what they can interact with or where they can go.

Players will learn what is interactive and it will attract them toward these affordances.



Consistent color and shape establish a trust contract with players who use this to learn the game rules.

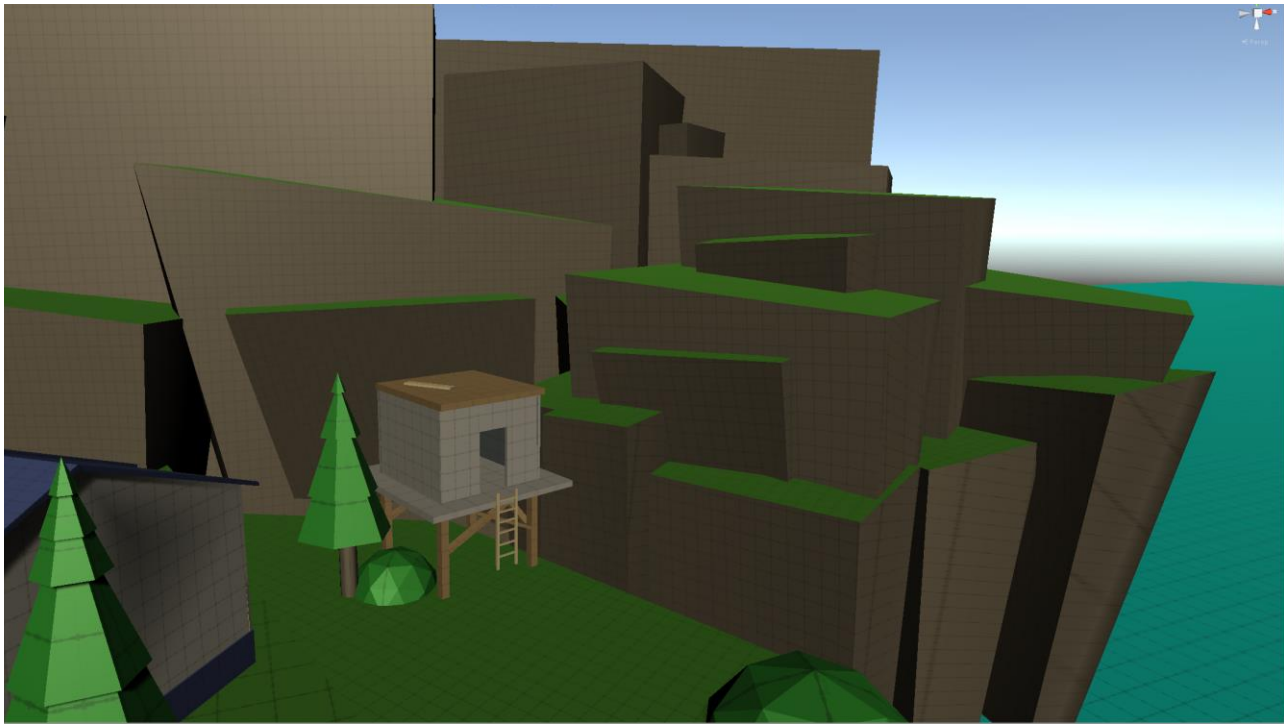


You should ensure that all of your affordances work consistently throughout the game or it breaks that trust contract which will cause player frustration.

You should also include affordances your Blockmesh phase.

It will help guide players where you want them to go.

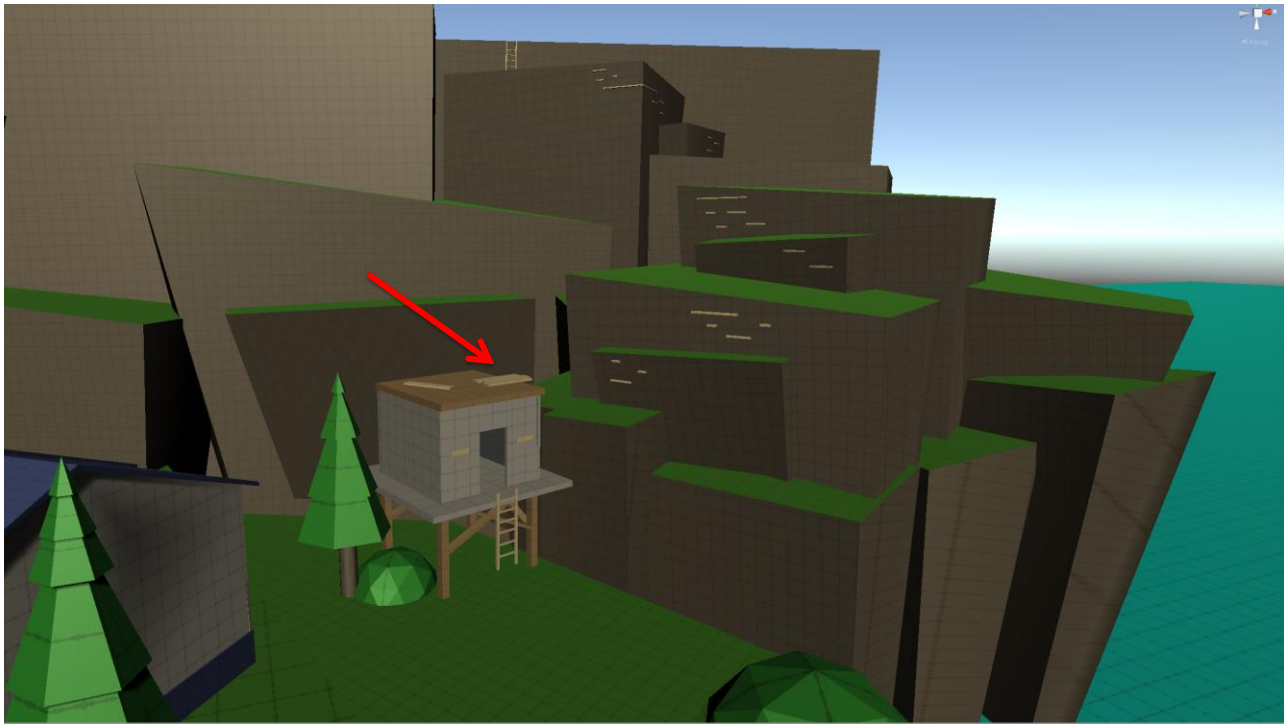
Let's see what that looks like.



In this blockmesh, it’s not clear where the player should go next.

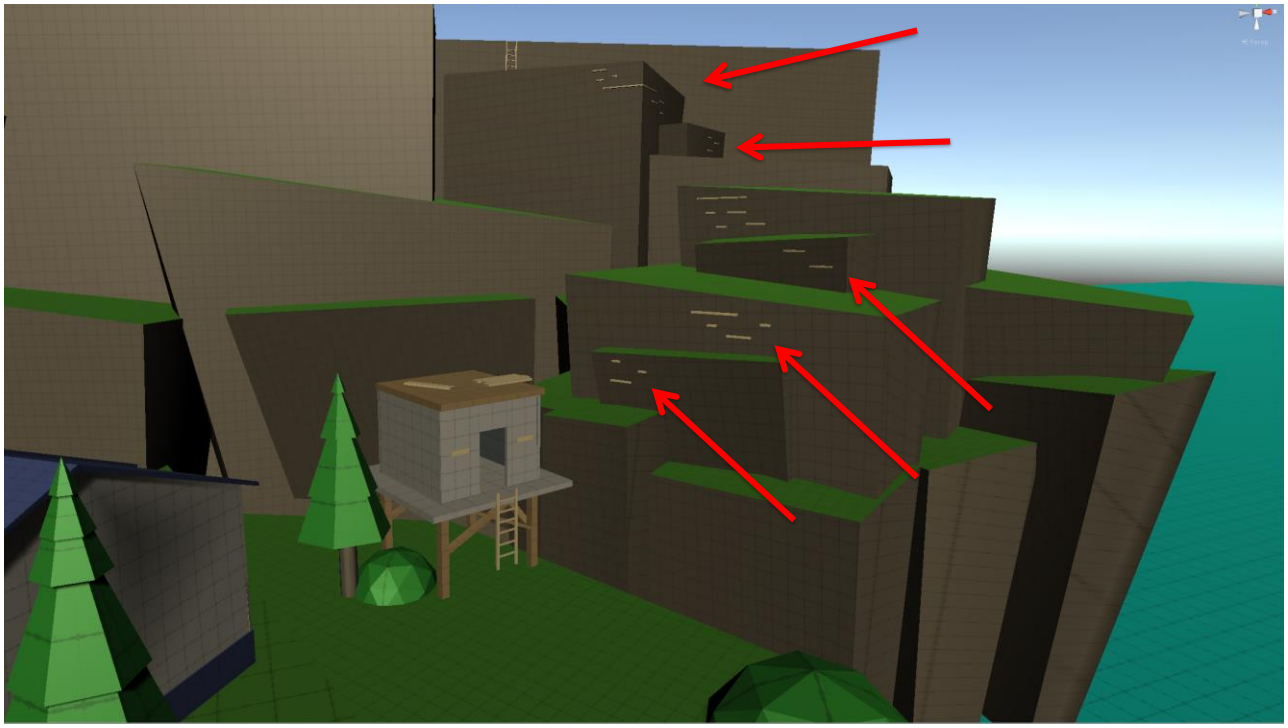
Sure the ladder affords climbing the little tower, but then what? Jump to the cliff? Dive into the water?

But if we add affordances…



…it becomes clear where to go.

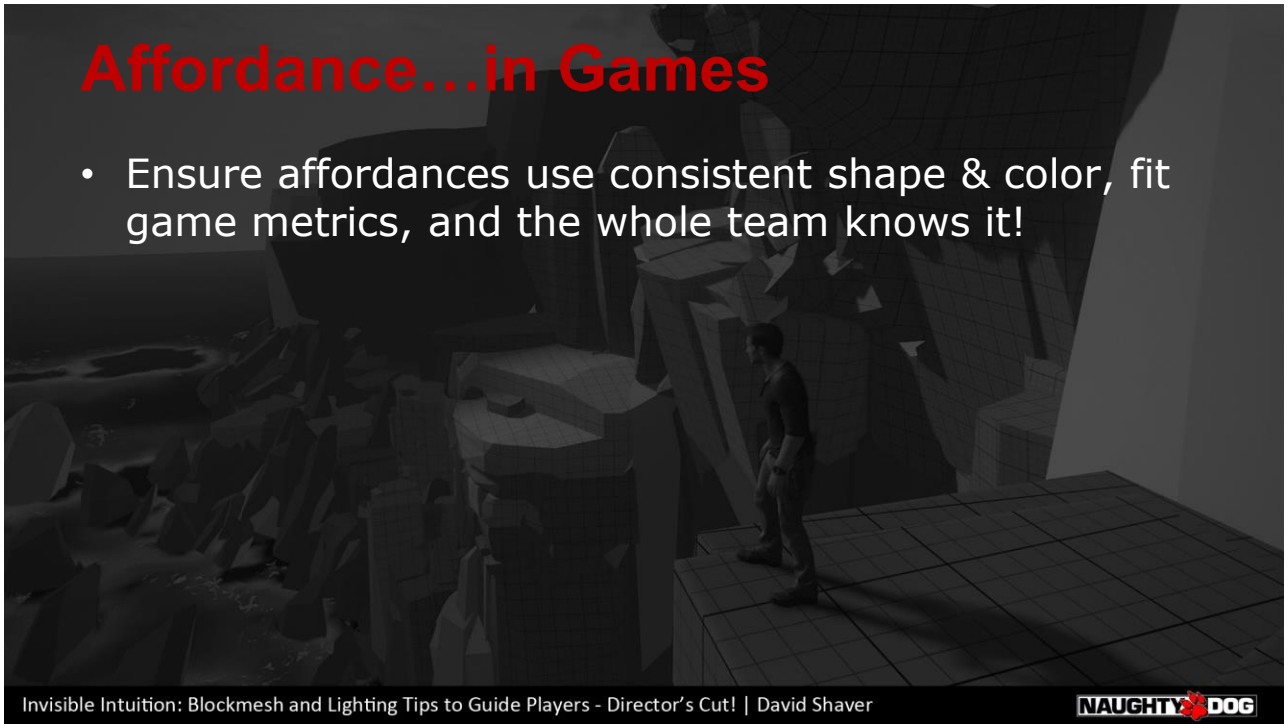
The boards on the roof afford jumping to the cliff.



While the edge grabs on the cliffs afford climbing.

Of course, this example is tailor-made for a game like Uncharted, but the same concepts apply to your traversal mechanics.

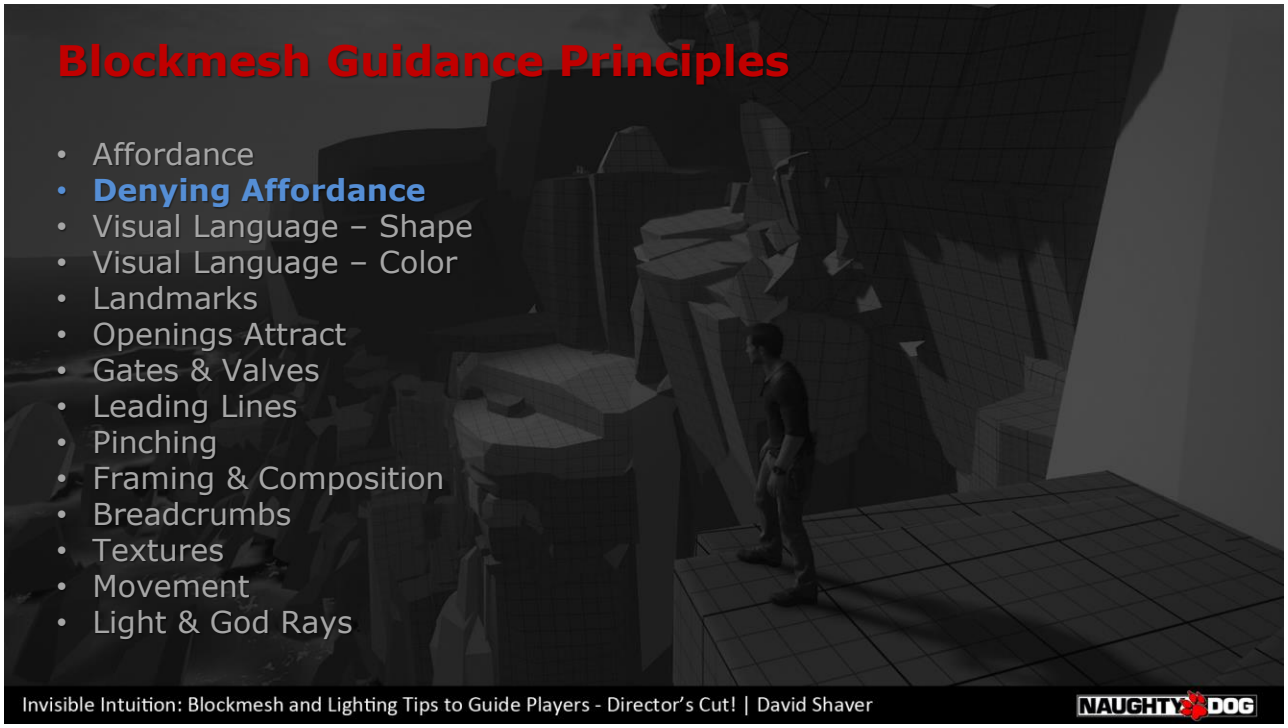
It may seem silly to add these so early, but trust me, it makes a world of difference in your playtests and doesn’t take much effort.



One more thing.

Ensure your affordances use consistent shape and color, follow the game metrics, and you empower your team with this information.

They could even prefab objects the entire team can use.



Next tip – denying affordance.

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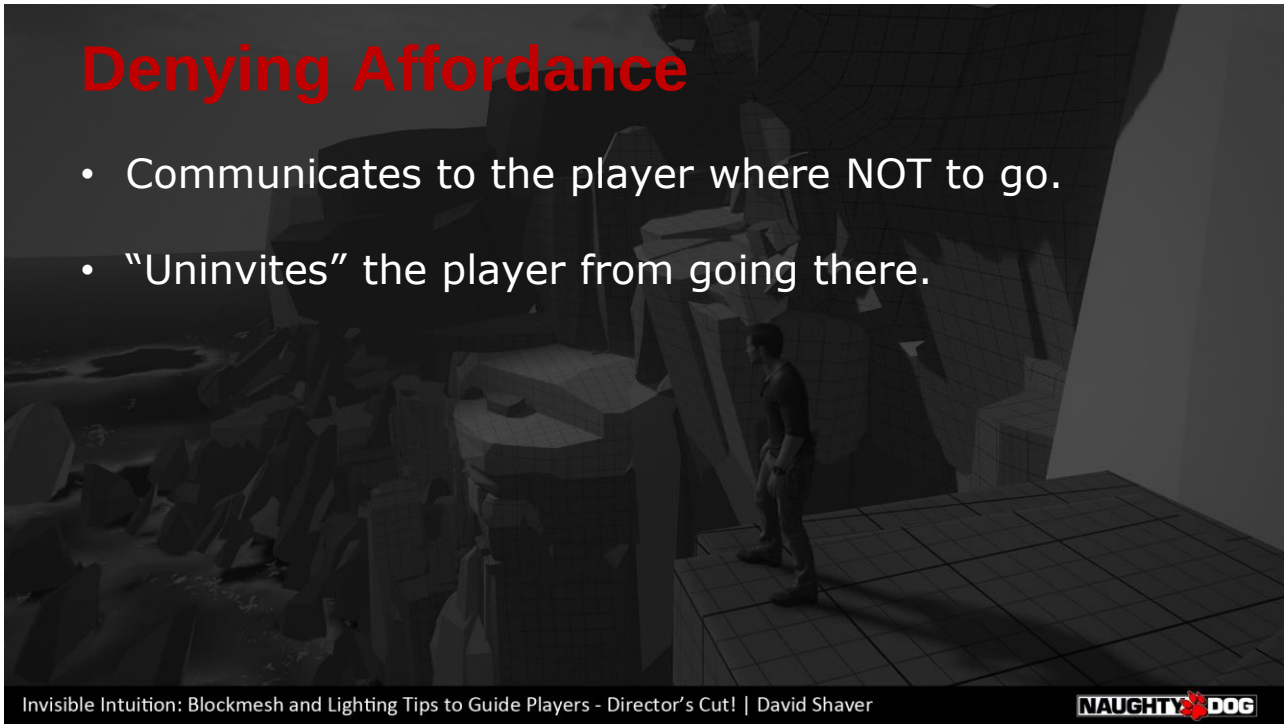
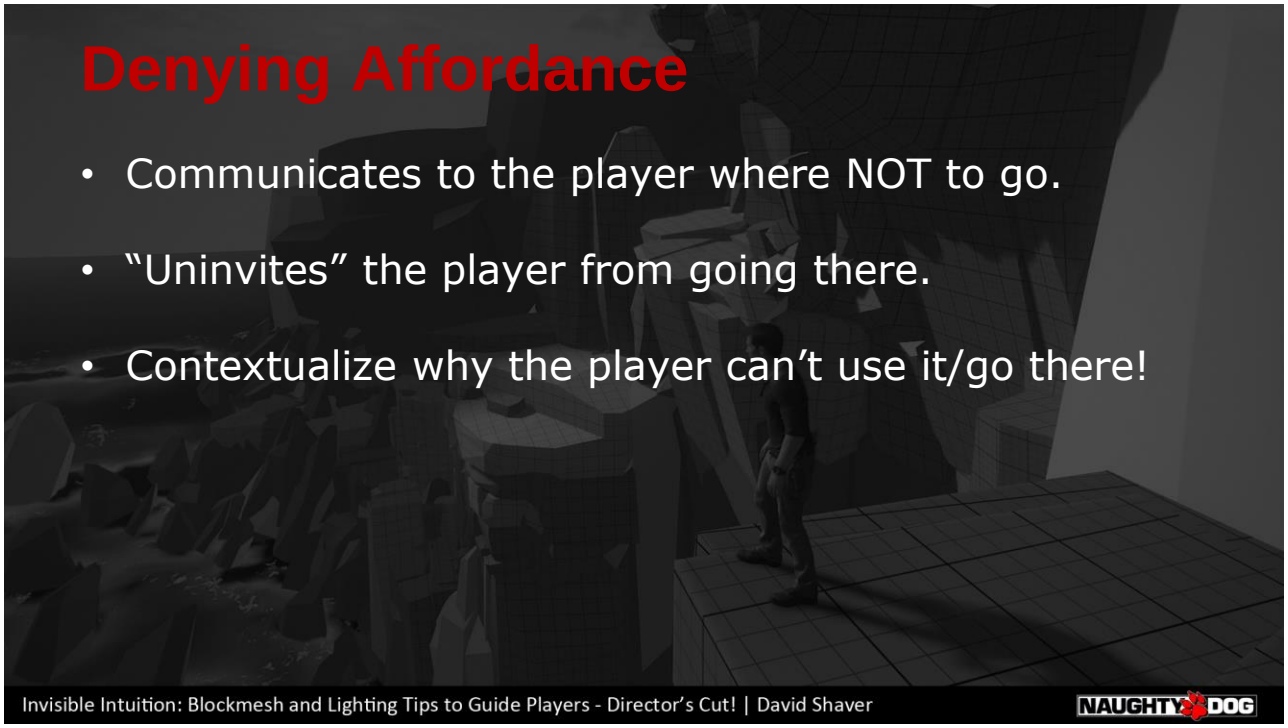


While affordances are important at showing players what they can interact with, showing them what they CANNOT interact with is also important.

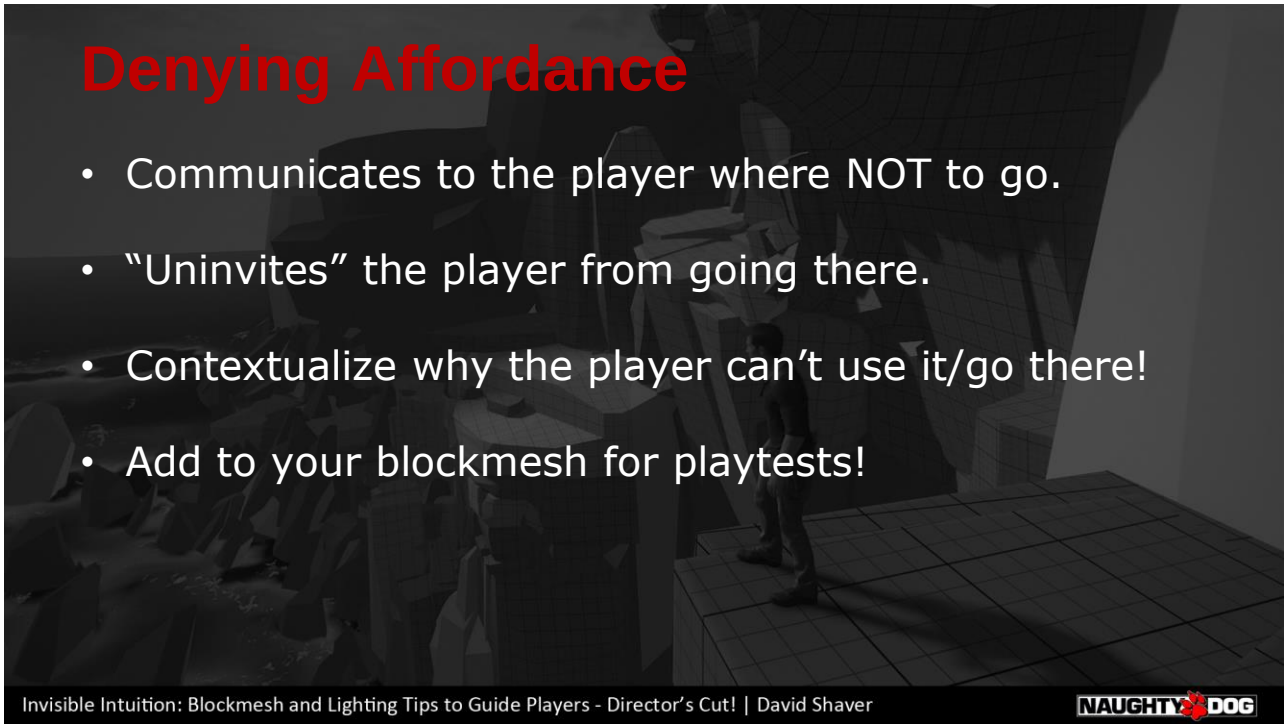
This is "denying affordance" and it prevents player frustration and guides them.



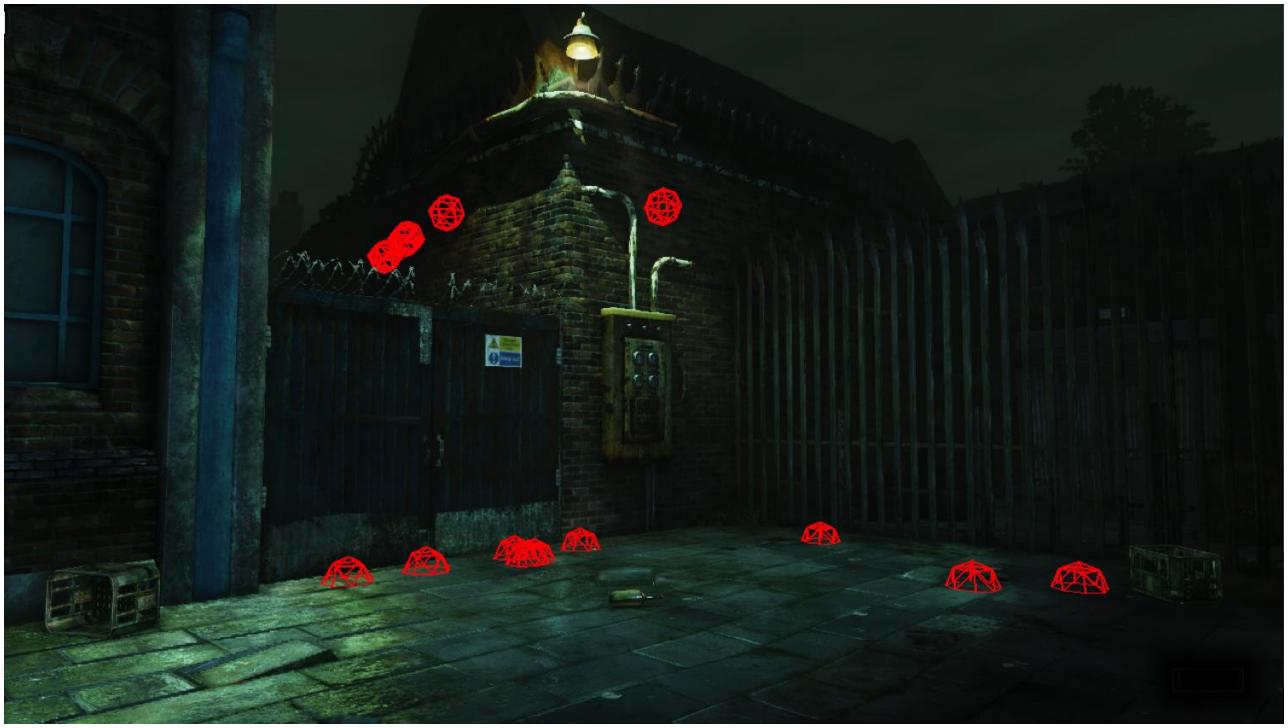
Now, you can't just disable a ladder or place invisible walls.

I mean, you CAN, but you shouldn't because it will just confuse and frustrate players.

You need to contextualize why you can't use the affordance by adding clearly visible things that say "can't use this" or "don't go here."



Also, make sure the reason for denied affordance is clear in your blockmesh.



At Naughty Dog, we record when a playtester tries to jump and grab something they can’t grab.

We call these “bad jumps” and overlay them as red spheres in game so we can identify problem areas.

Often, we’ll find something that LOOKS climbable but isn’t supposed to be.

So we cover it with foliage or something, and after the next playtest, those “bad jumps” are gone.

Like sanding down a piece of wood, this process makes the levels play much smoother.

Also, thank you, Richard, for this lovely screenshot! It saved me a lot of time.

If you haven’t seen his 2012 GDC talk, “Attention, Not Immersion”, you really should see it!

The Last of Us – Naughty Dog
Designer: Peter Field

Here’s an example of using spiky shapes and breaking up the horizontal edge to deny climbing affordance.

Even though the window is within climbing range, you still can’t grab it because it’s visually blocked.

Notice how this is contextualized to the environment with bricks and rebar.

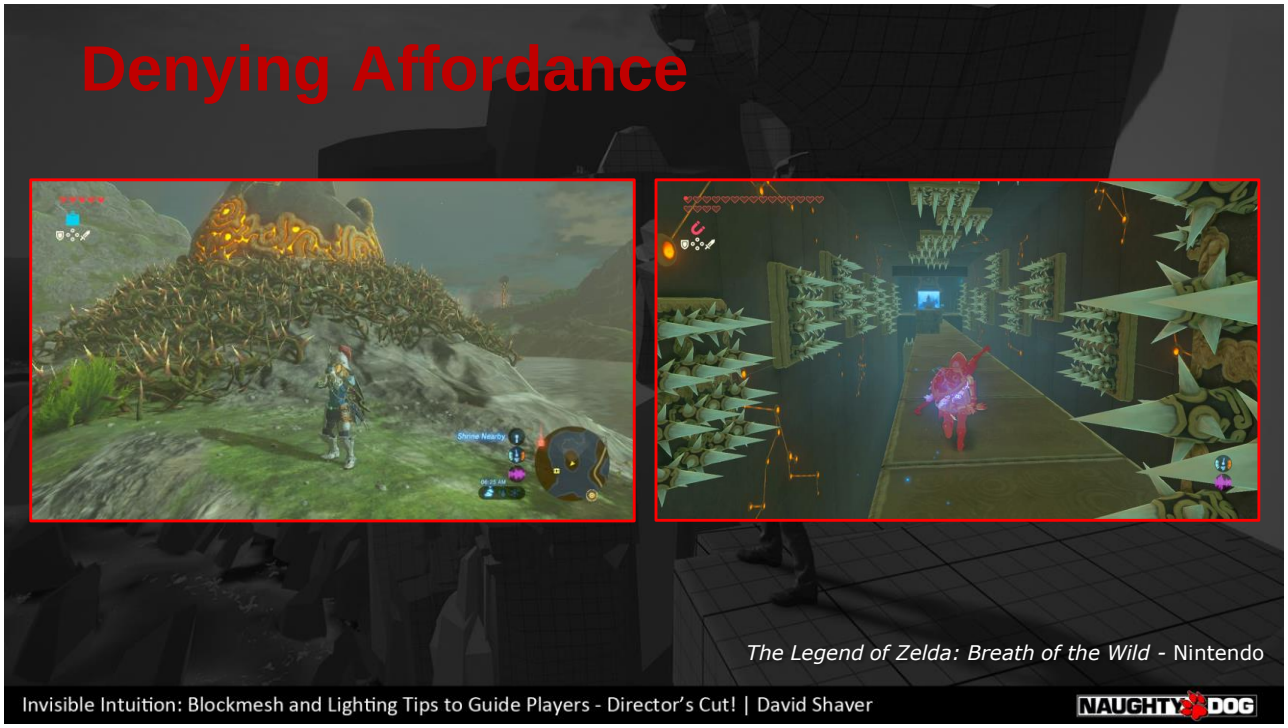
This is important for games grounded in reality.

The same technique is used here Uncharted 4.

Without these boards, players would want to jump right out that window instead of going to the room on the right which has cool stuff in it.

Notice how both examples are contextualized to their environment.

This is very important for games grounded in reality.



For games not so grounded, you can get away with a lot and that's OK.

Just find the right tone and context for YOUR world to make it feel natural and still deny affordance.

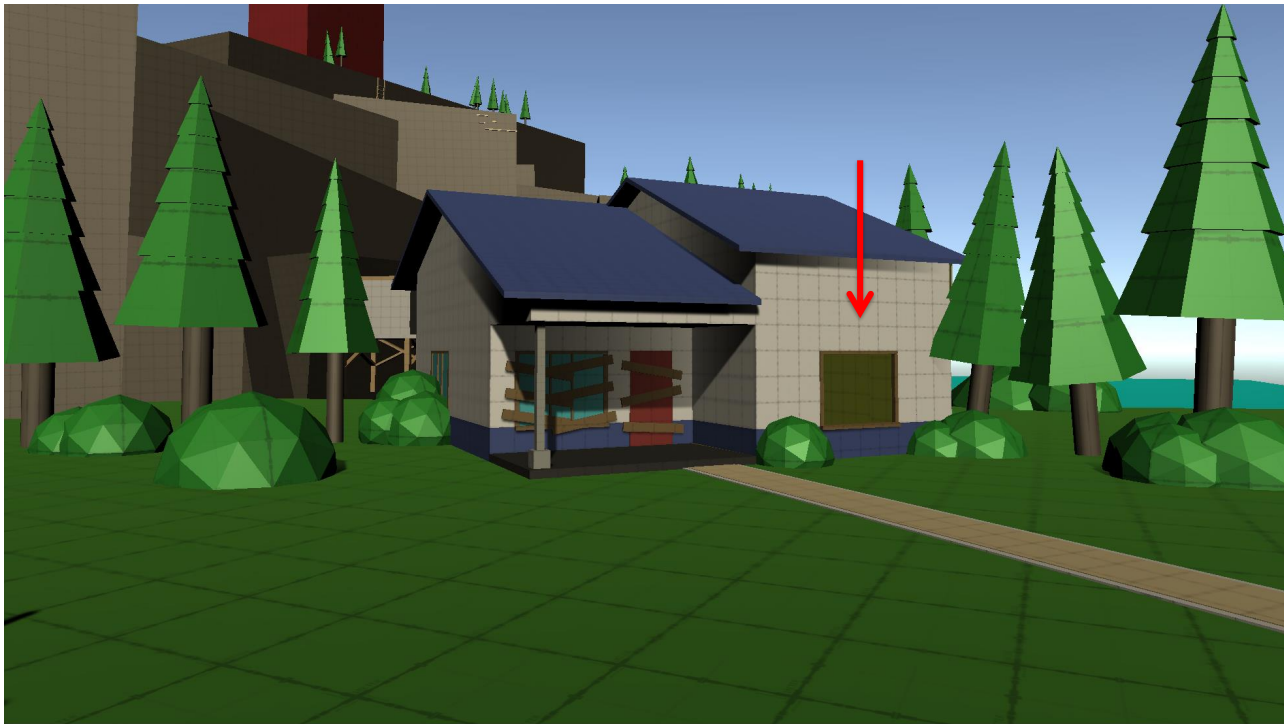
Props can be improved by denying affordance too! Check out this train track switch.

It’s kinda hard to see, but on one side, there is a nice horizontal bar to grab and on the other, some spiky shapes.

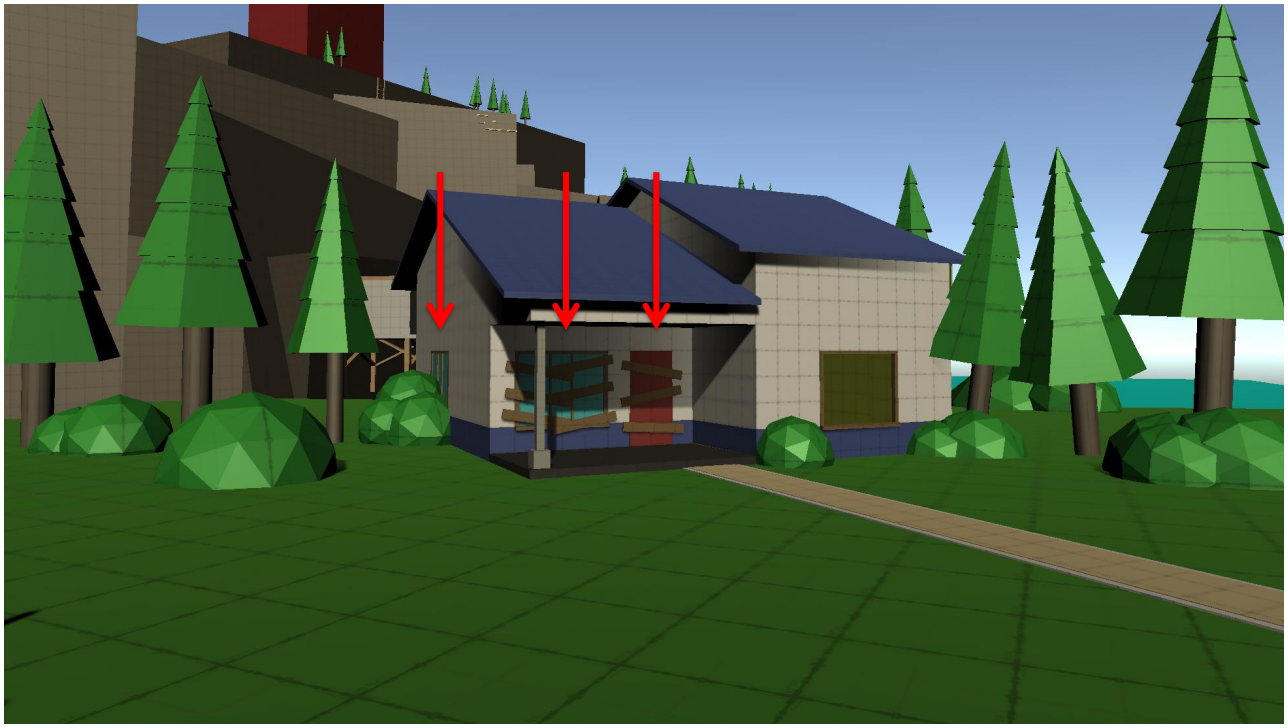
So, let’s highlight them!

We did this so that you would be on the left side looking at the track, and be able to see the track switching.

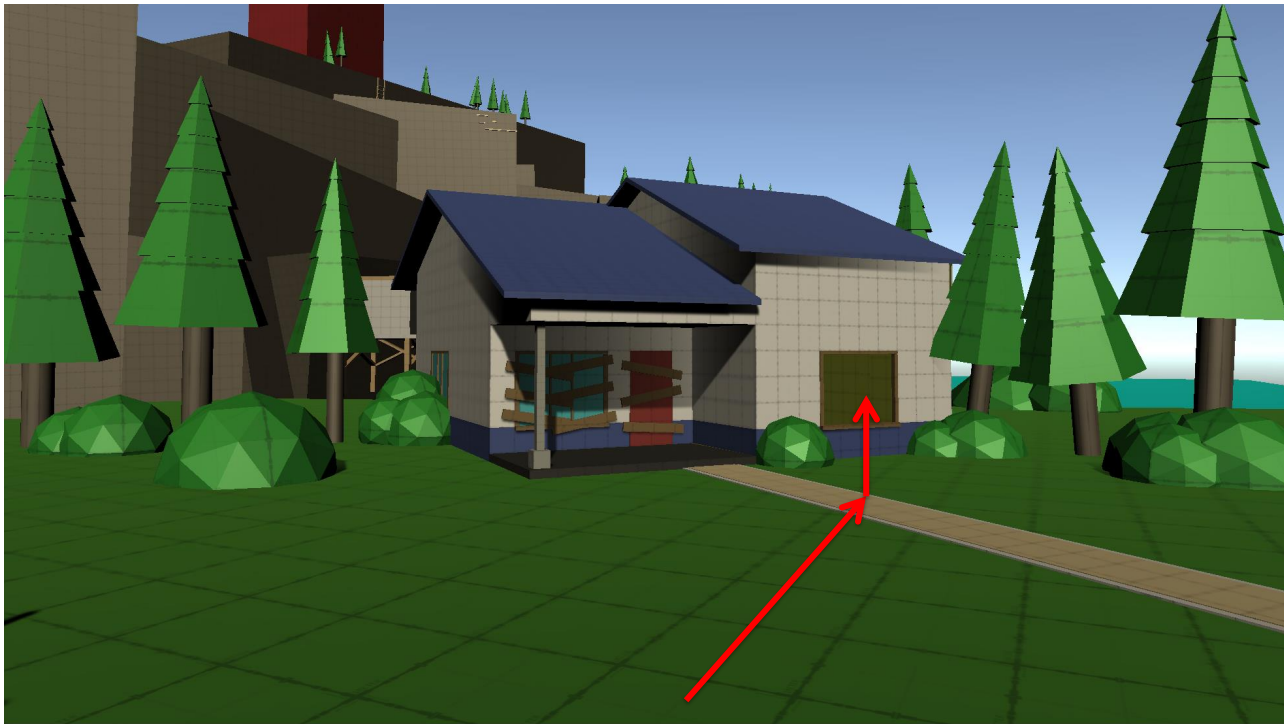
Now let’s see a Blockmesh example.



Let’s say we want the player to go through the window on the right, which is busted open.

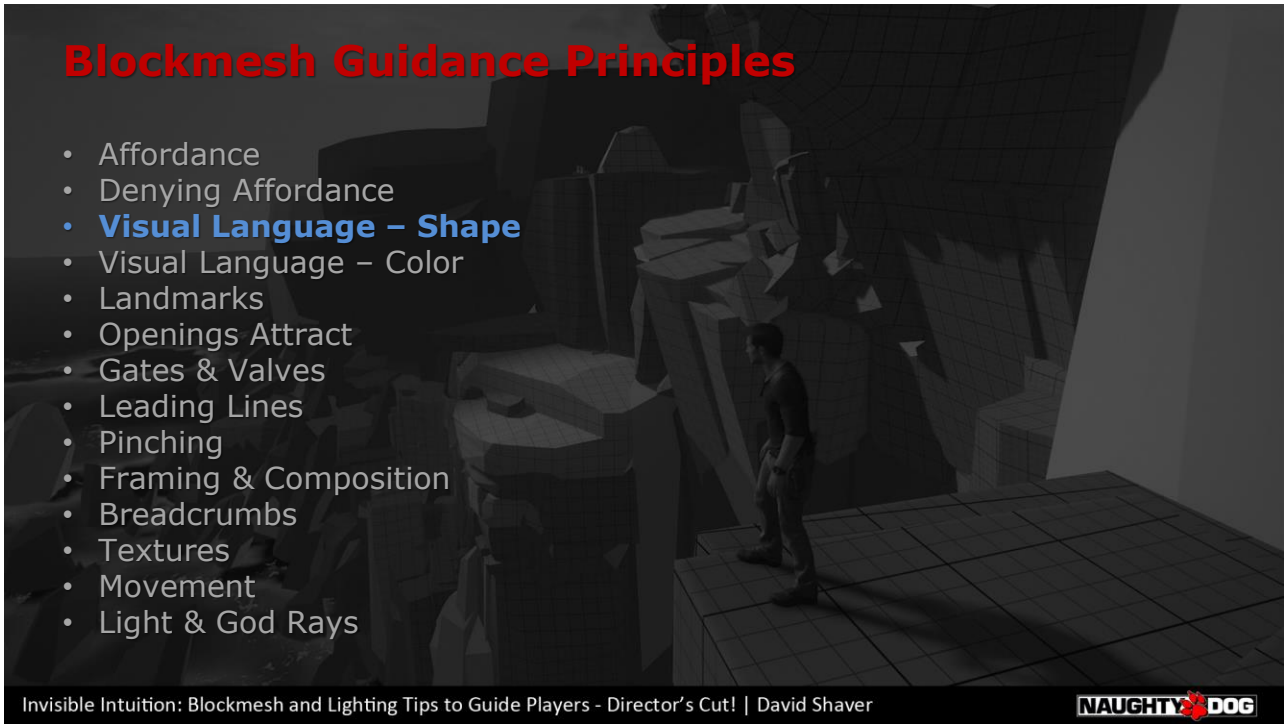


The left window is covered with a bush, and the front porch window and door are boarded shut.



Most players will glance at this house and go right for that window in a playtest.

The intended way forward is open, while the rest of the entrance affordances are denied.



Next tip –Shape language

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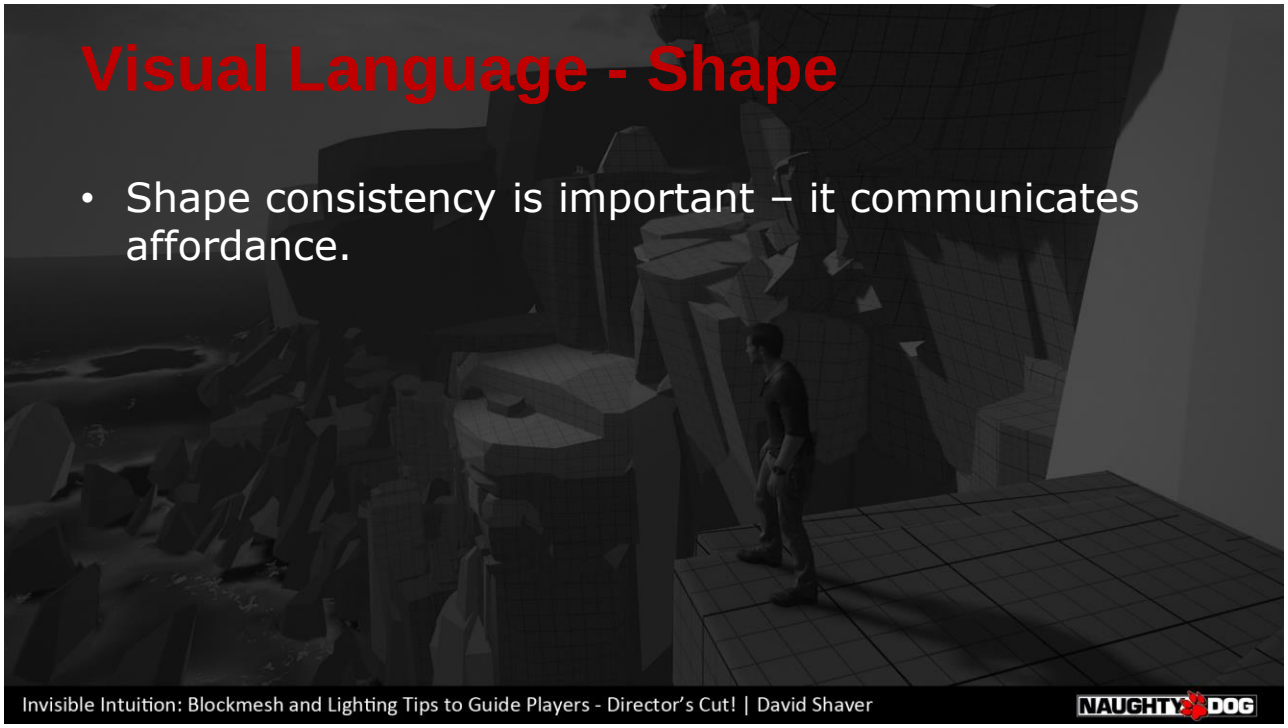


Establishing a consistent shape language communicates affordance and guides players.

How many times have you seen edges in an Uncharted game that make you go “ok, clearly I have to climb on those edges?”

Probably a lot right?

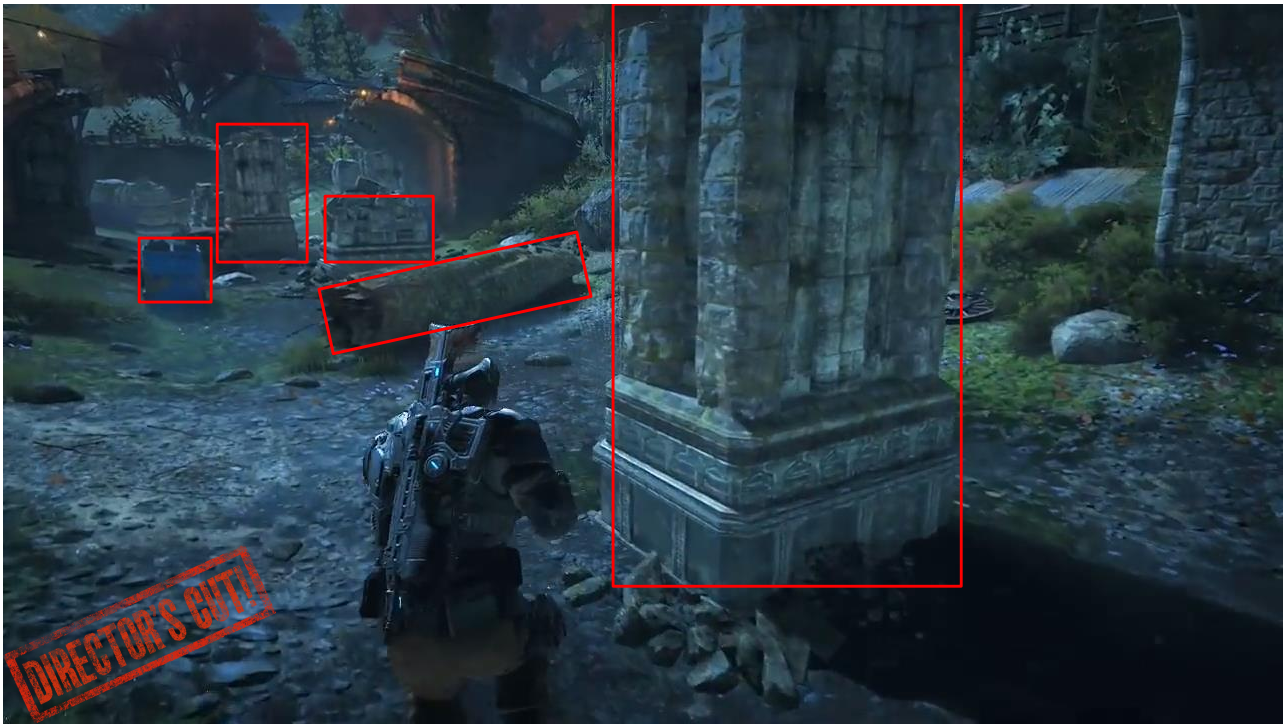
Climbing edges in Uncharted are always horizontal and flat.

As a player, you learn this visual language affords climbing and can spot it easily.

Let’s look at another example.

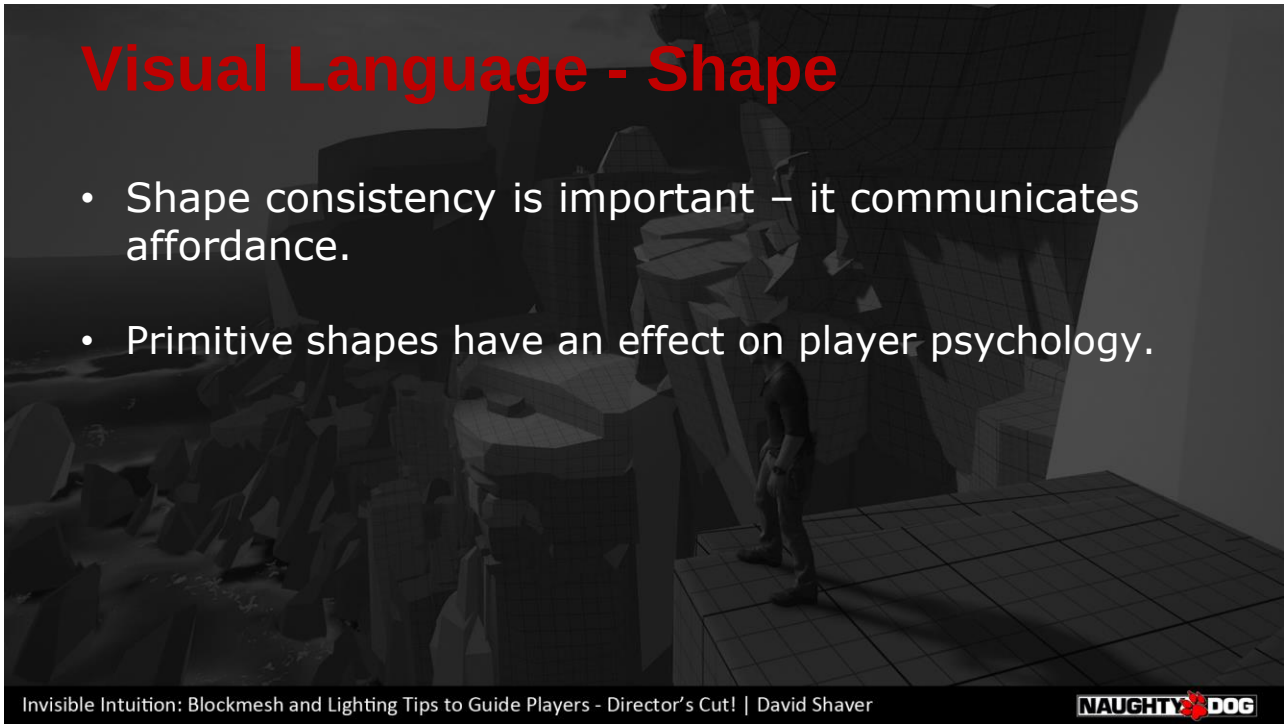
Let’s say you’re playing a 3rd person cover shooter like Gears of War, Mass Effect, or Uncharted.

I don’t know about you, but every time I enter an area like this I think “here comes a fight.”



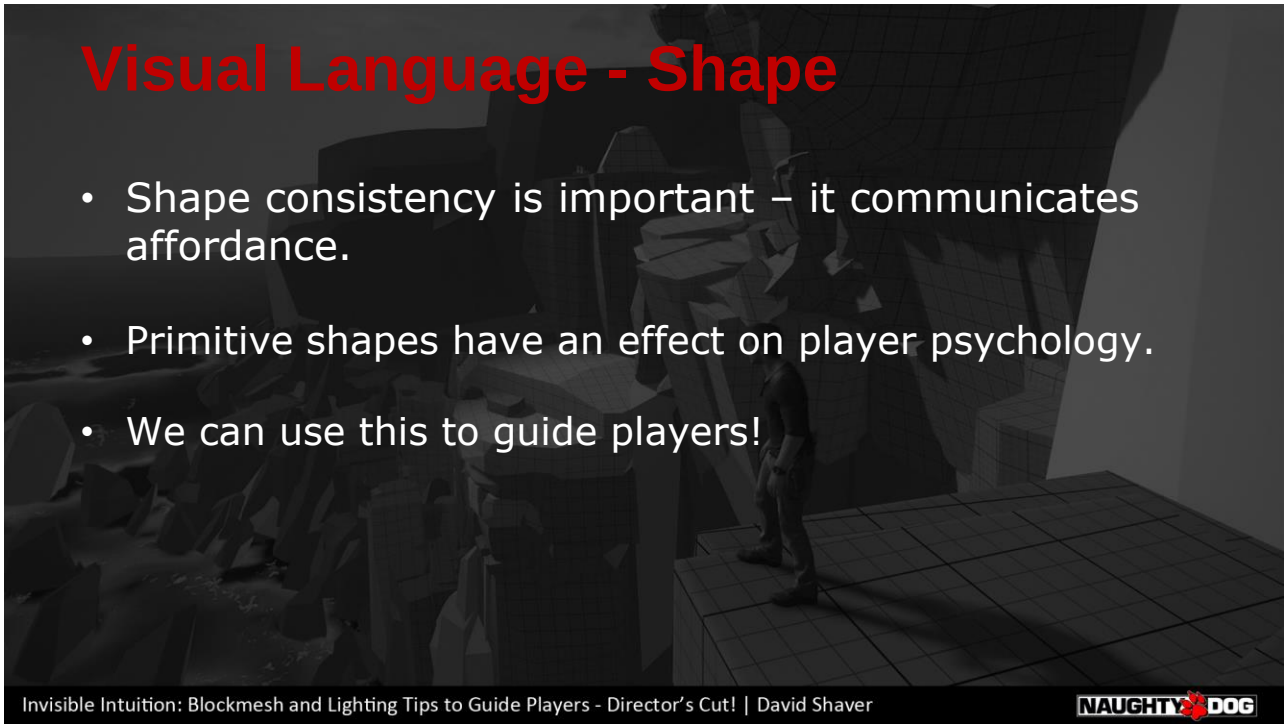
That’s because this kind of shooter has a consistent shape language for the cover (rectangular and waist high) that I’ve learned to recognize by playing these games.

I’ve learned that these shapes afford safety during combat and carry that knowledge with me to other games.

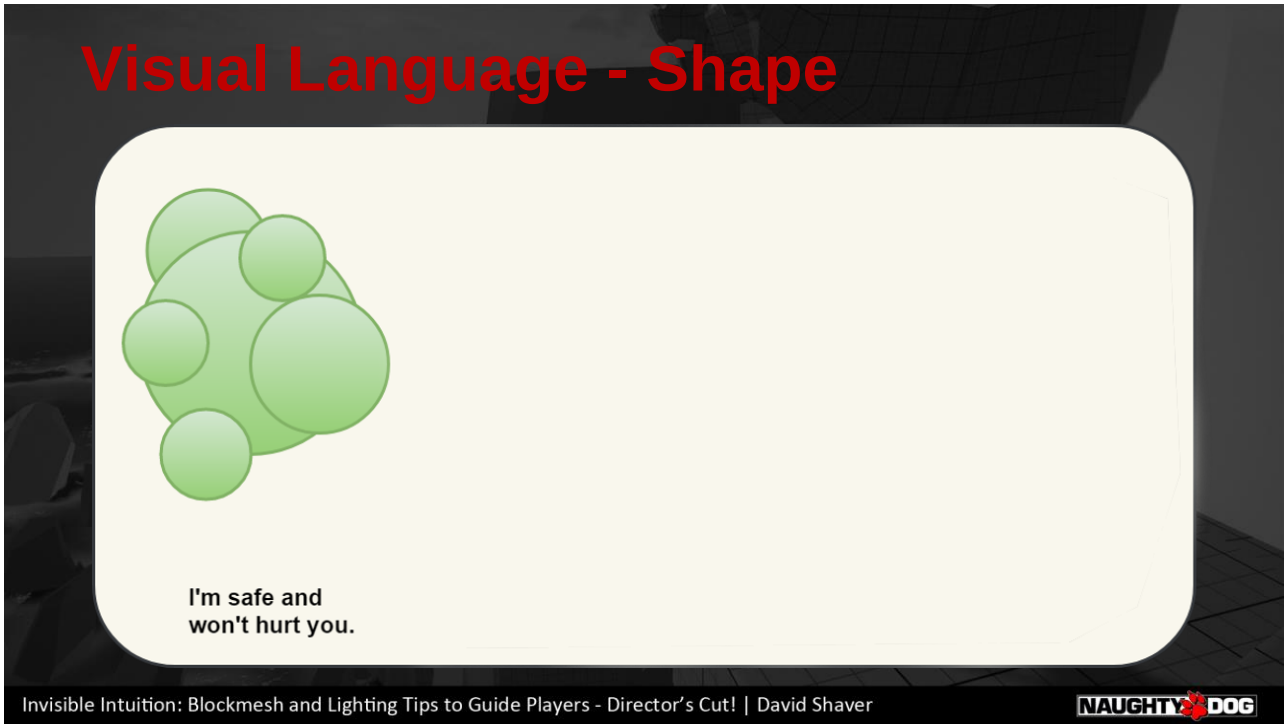


Also, people tend to have emotional associations to certain primitive shapes.

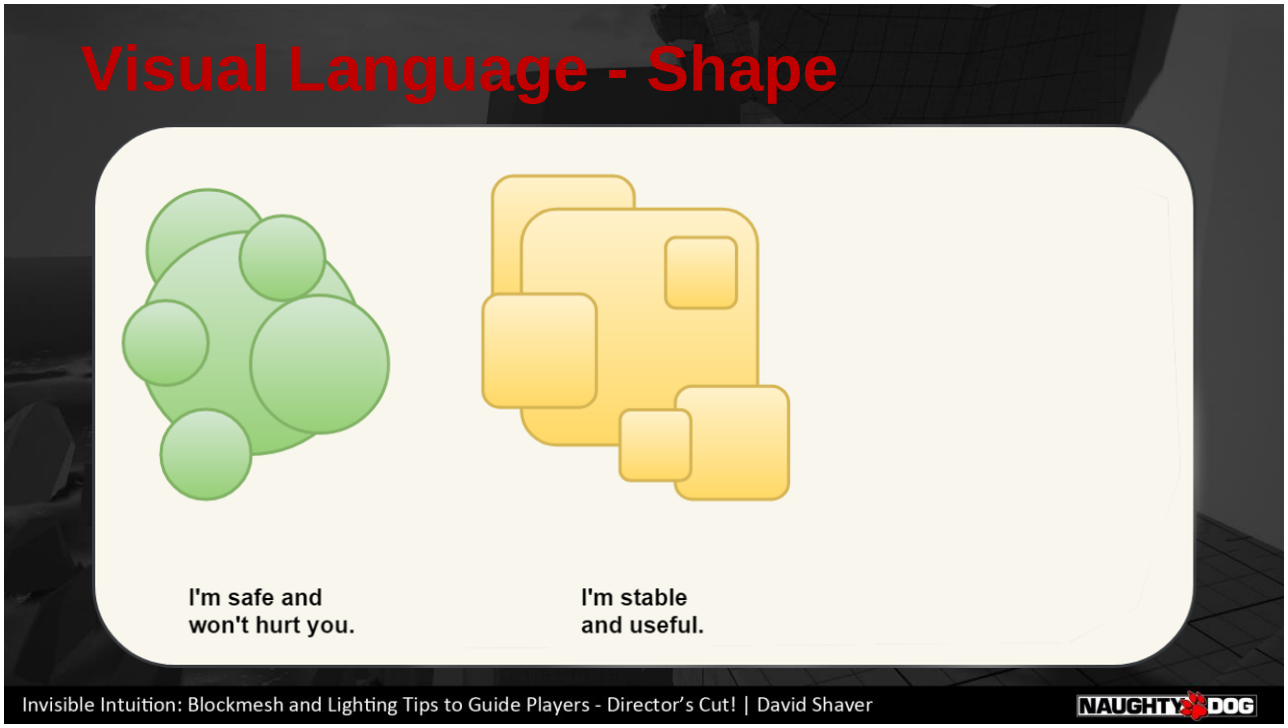
This even happens across cultures.



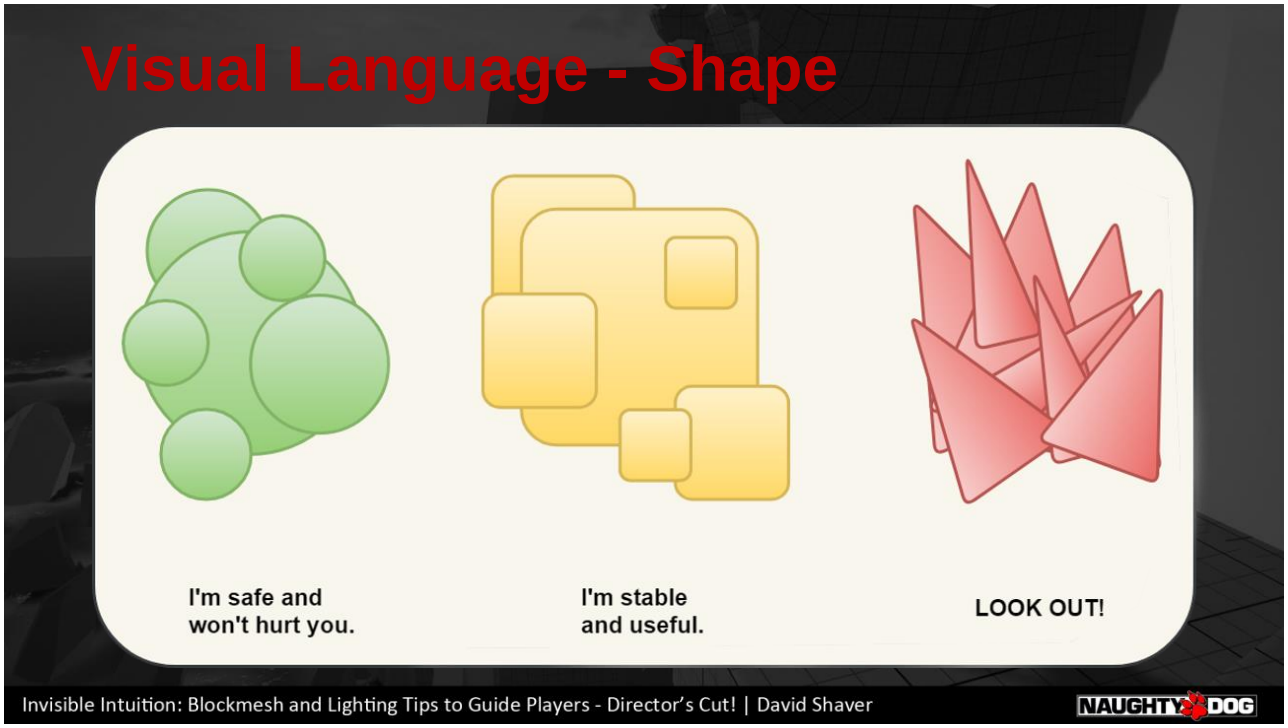
We can use this to our advantage to guide players toward or away from certain shapes.



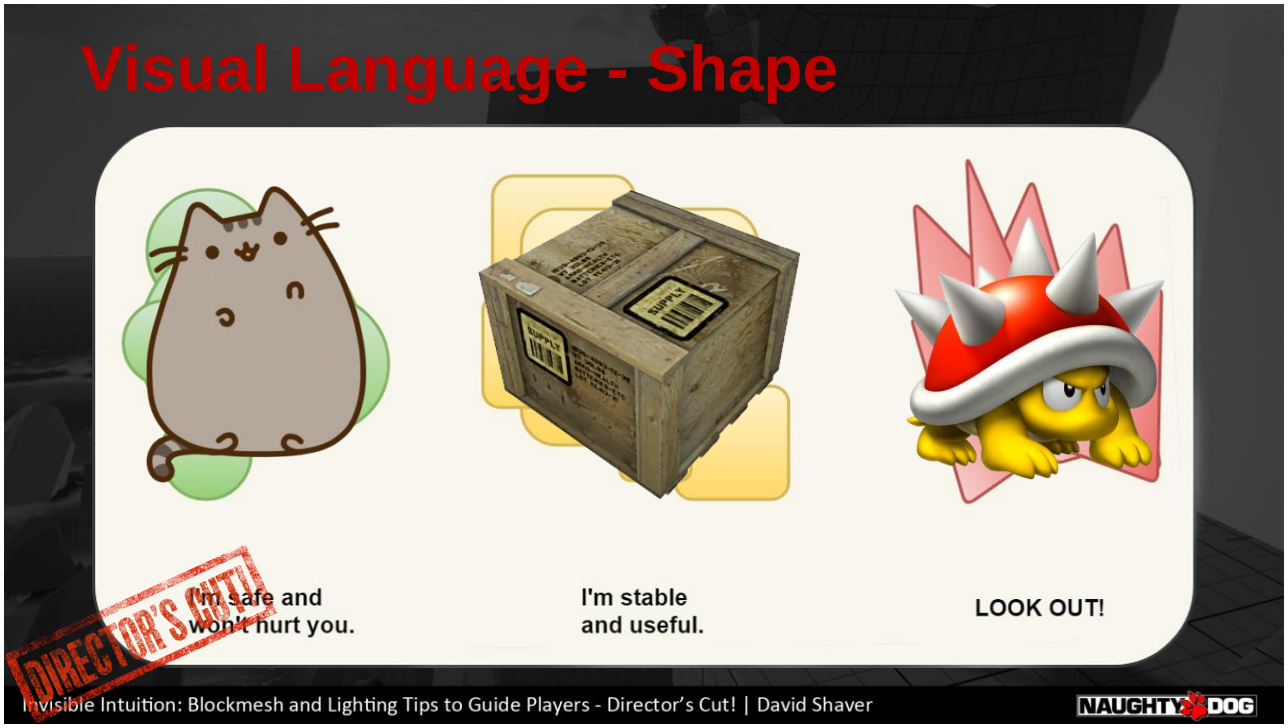
Round shapes tend to be viewed as nonthreatening – nothing to stab you with.



Rectangular shapes are viewed as stable and trustworthy – like a shelter.



Diagonal shapes are viewed as aggressive and dangerous – like a spear.



Look at these guys…living up to their shape stereotypes.

Although, while Pusheen the cat is round and adorable, I think she's up to something.

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: Ray Almaden

Let’s take a look at a screenshot from Uncharted: The Lost Legacy and highlight the shapes.

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: Ray Almaden

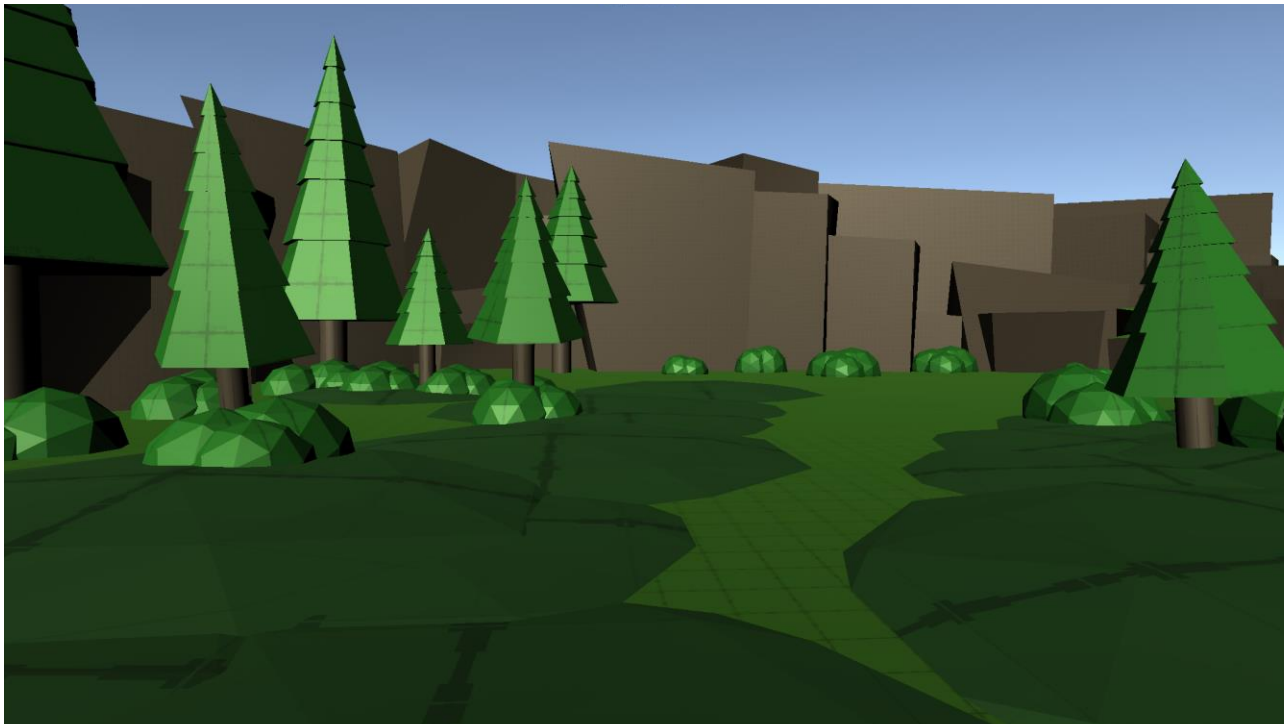
As you can see, the spiky shapes feel a bit uncomfortable, possibly causing you to want to avoid the area.

The round areas aren’t a threat and provide stealth.

The square shapes are combat cover or buildings – nice and stable.

All of this subtly guides you to the buildings.

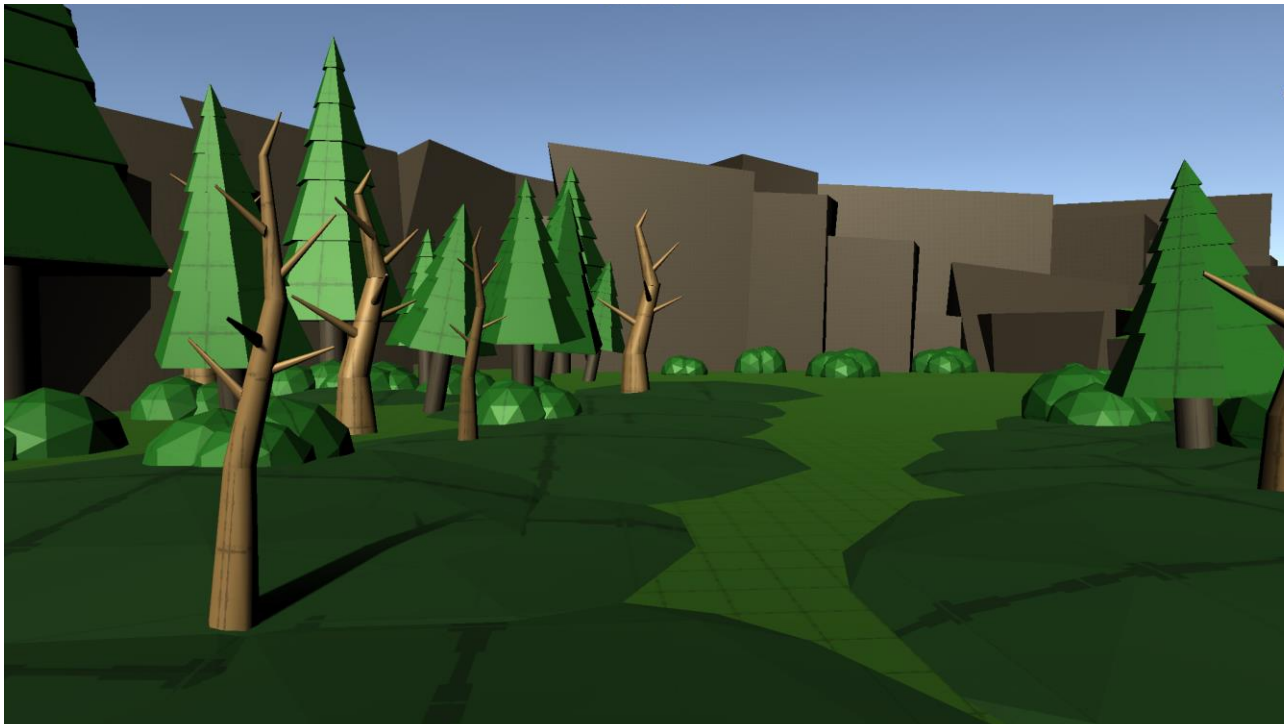
Now let’s see what it looks like in blockmesh.



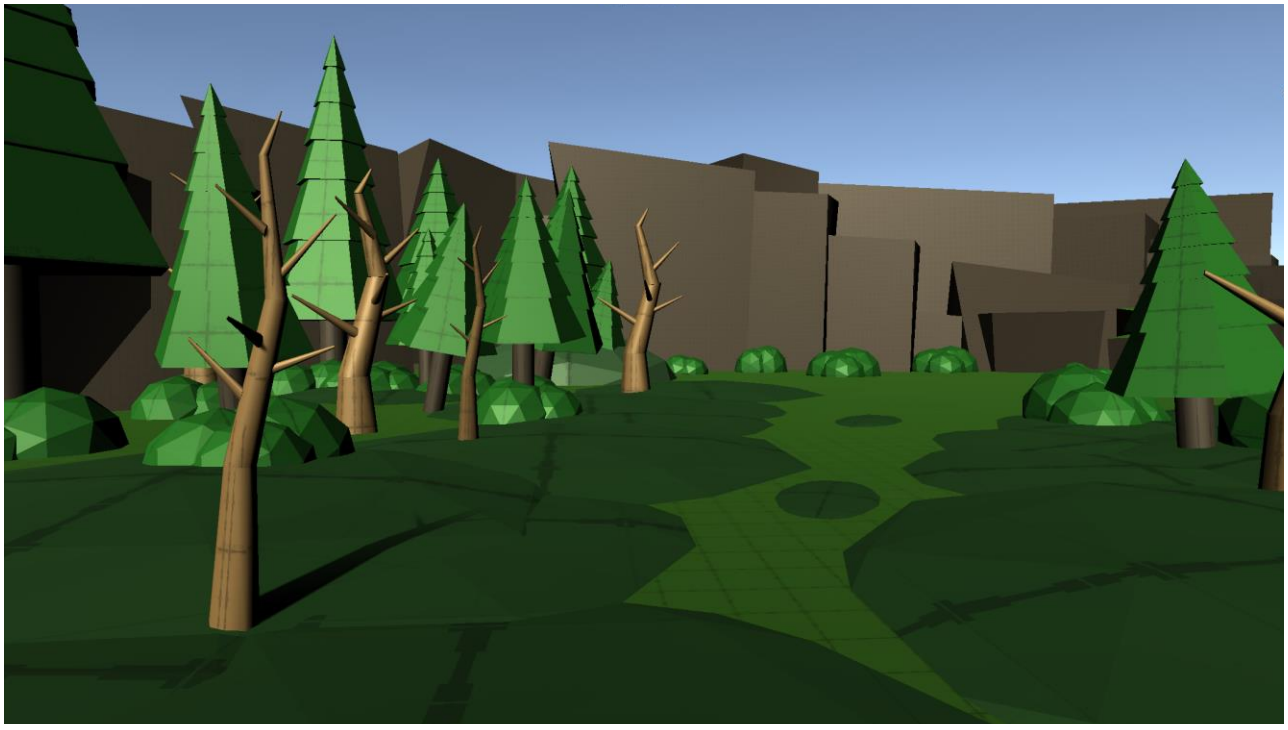
Let’s say we want players to go to the right and they are being chased so exploration wrecks pacing.

The path sort of leads there, but some players may veer to the left.

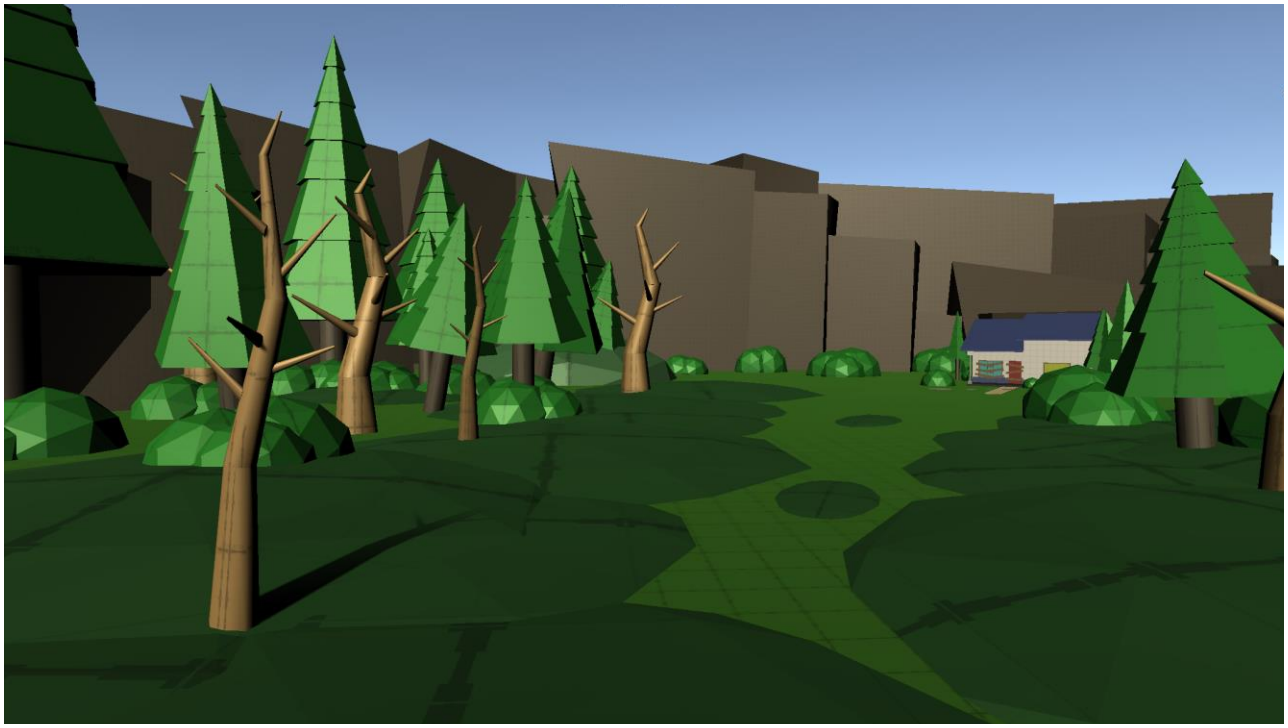
How can we nudge them to go to the right?



First, let’s add some spiky trees and some other pine trees that angle toward the goal.



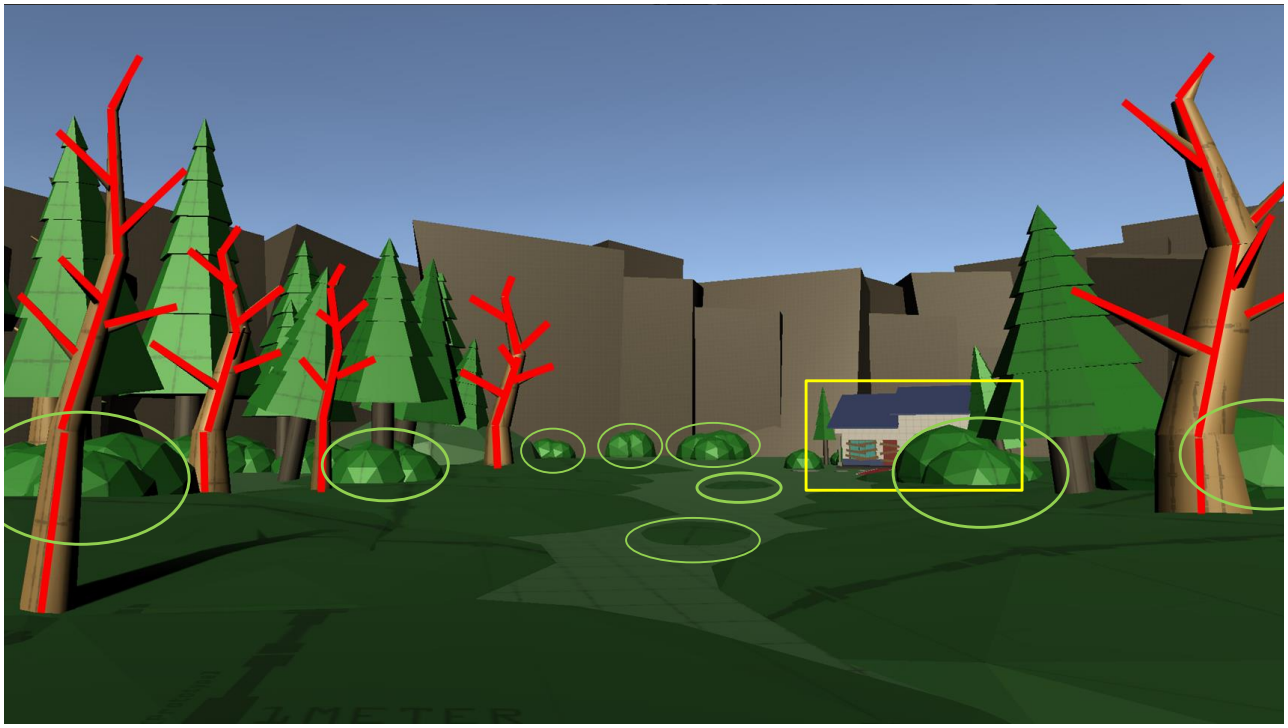
Then we add some round bushes.



Finally, we add a small building.

OK, not gonna lie, at this point I feel like this.

But…with a lot less hair.



Let’s highlight those shapes we just added.

The spiky shapes say “danger” and discourage going there.

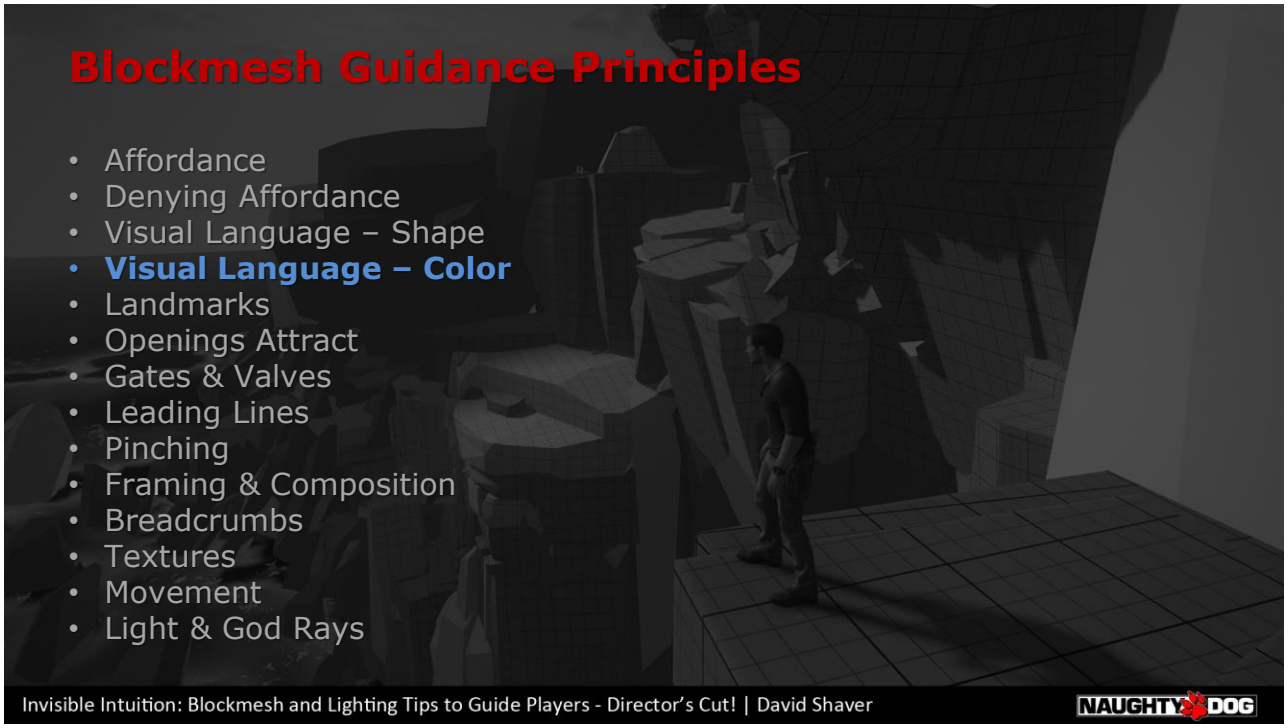
The square building, implies “hey, stability this way!”

The round stepping stones on the ground act as breadcrumbs to safety.

And the round bushes act as bumpers to frame the play space.

Of course, none of this prevents players from going wherever they want.

It just gently guides them where they SHOULD go.



Next tip –Color language

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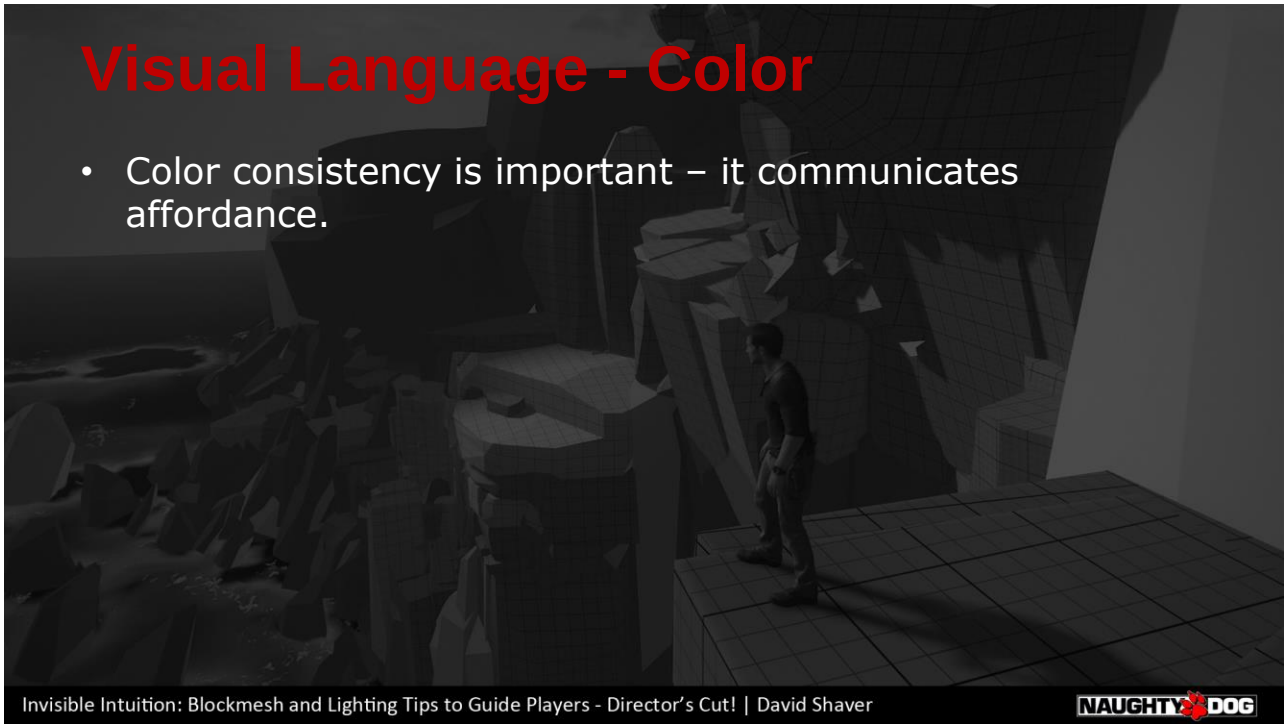
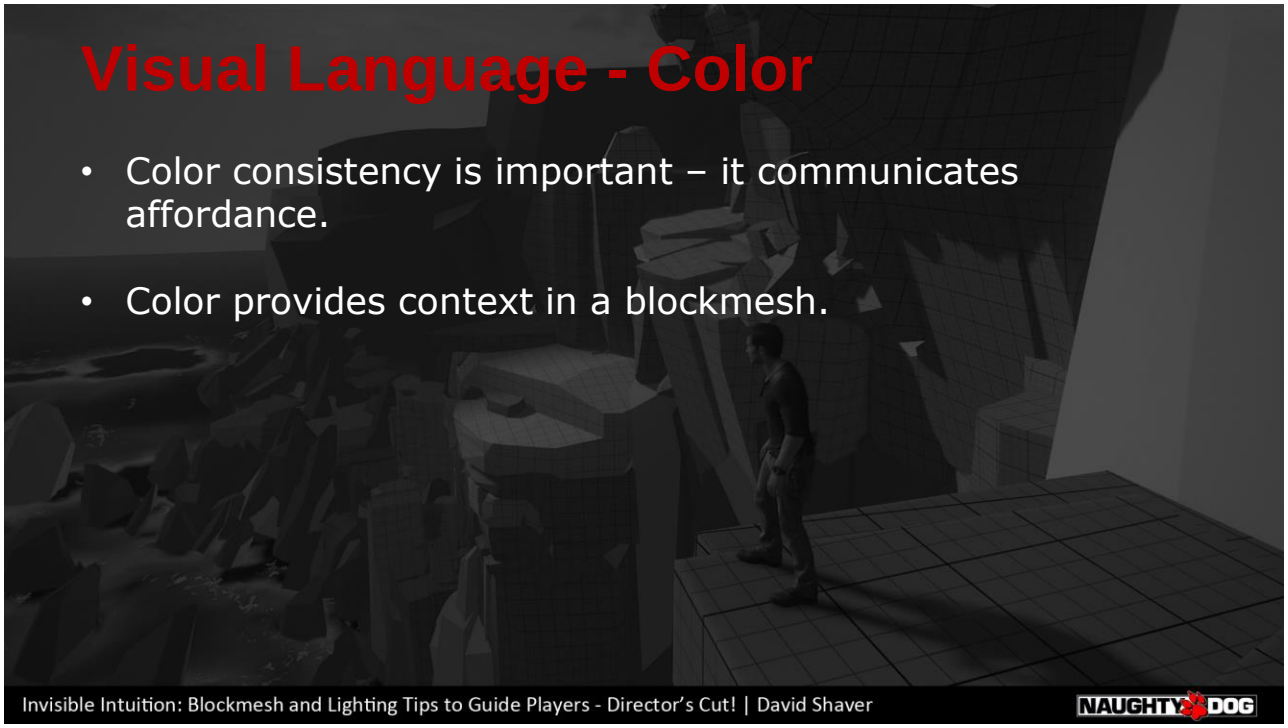


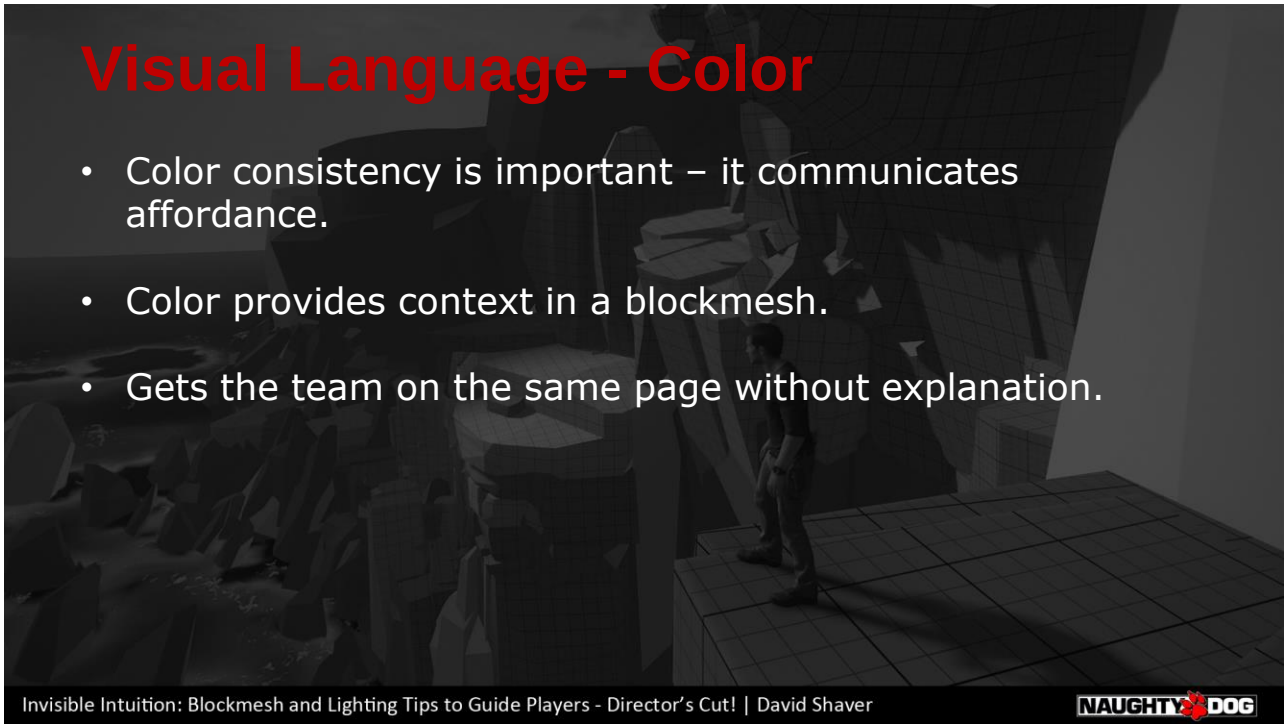
When you are trying to establish a consistent visual language in your affordances, shape is only half of it.

You also need consistent colors as well.



Adding color provides context for an otherwise barren blockmesh.

It also adds depth if you are making a 3D game.



Coloring also speeds up collaboration with your team because at a glance, they can "get it" without explanation.

The Last of Us – Naughty Dog
Designer: Jacob Minkoff

Naughty Dog is notorious for using contrasting colors to draw the eye to where you should go.

Here we have a bright yellow sign and rail. It subtly lets the player know where to put the plank.

Most people won’t question why only one rail is yellow, and will just remember they intuitively knew where to go.

Here, Naughty Dog uses a combination of many topics in this talk: yellow color, light, moving water, and a buddy who is shining a light at and commenting on the way forward.

All of this draws your attention to the yellow climbing edge.

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: Derek Chatwood

Here we have white climbable edges!

And here are more edges.

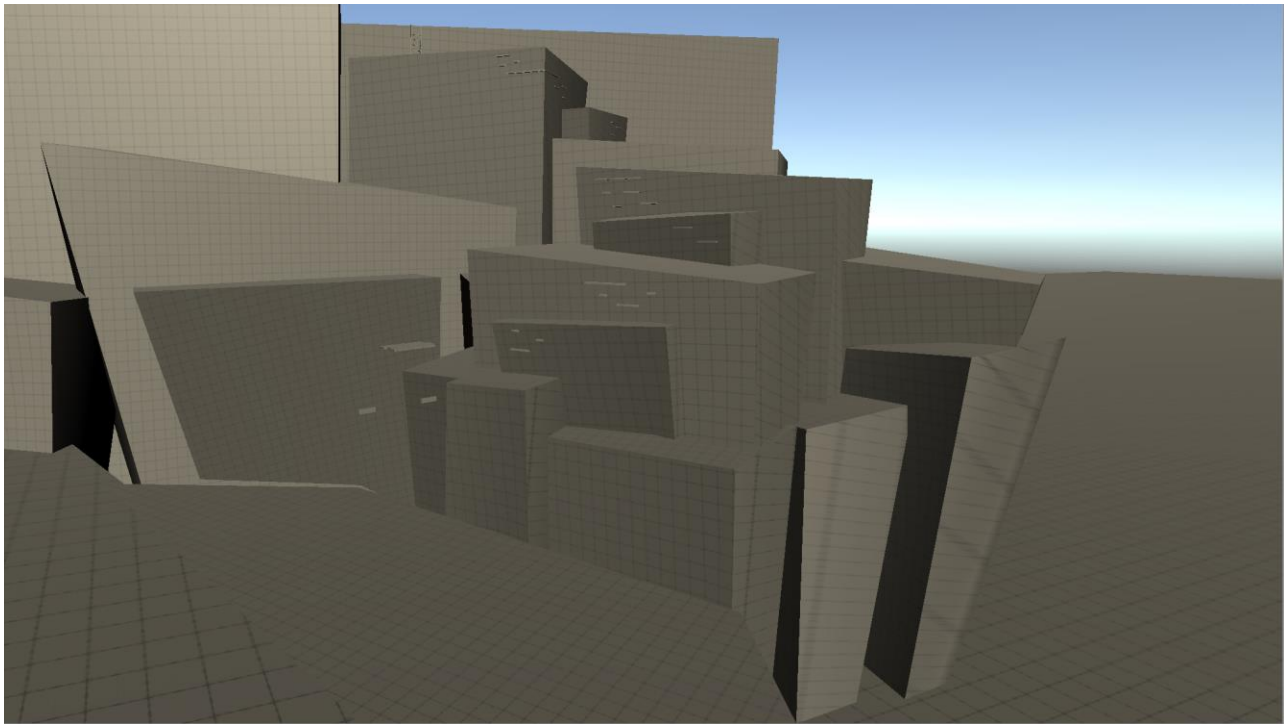
But wait, these are green. I thought you said to be consistent!

Well, it’s not a SINGLE color that is important.

It’s using consistent colors AND shapes in the CONTEXT of the environment.

Try to blend them into the environment so it looks natural, but still stands out.

Let’s see how color can aid your blockmesh.

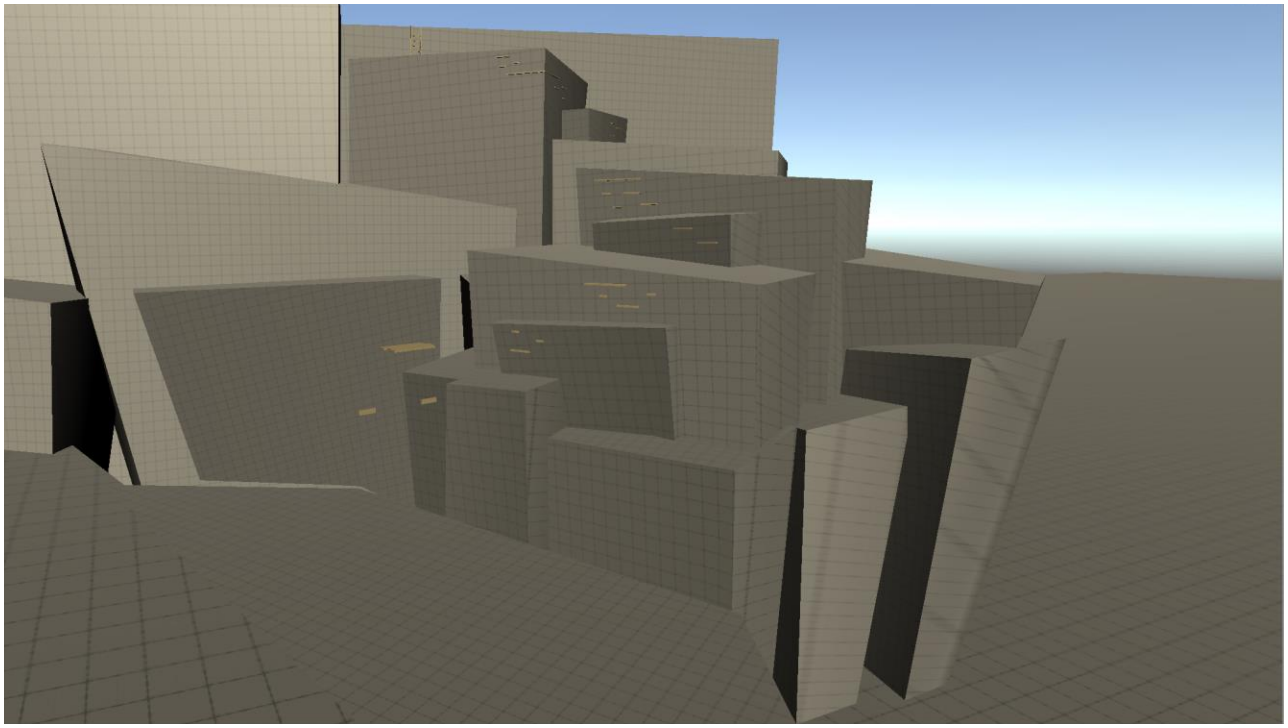


Here we have a greybox.

It’s not really clear where the player should go or even CAN go.

Affordances are grey and hard to see.

Also, what kind of environment is this? Desert? Icy Planet?

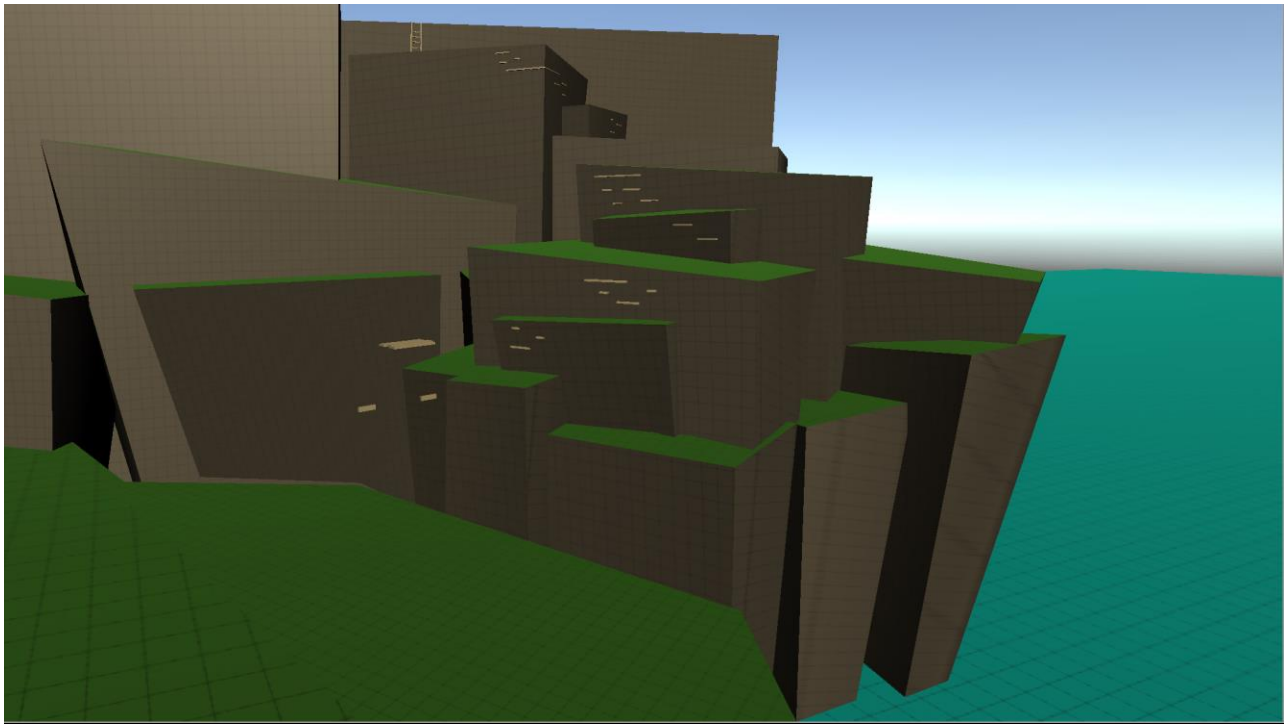


First, let’s add color to the affordances, so that you can see them and the path forward…sort of.

But we’re still missing context.

What is this place?

Everything still blends together.

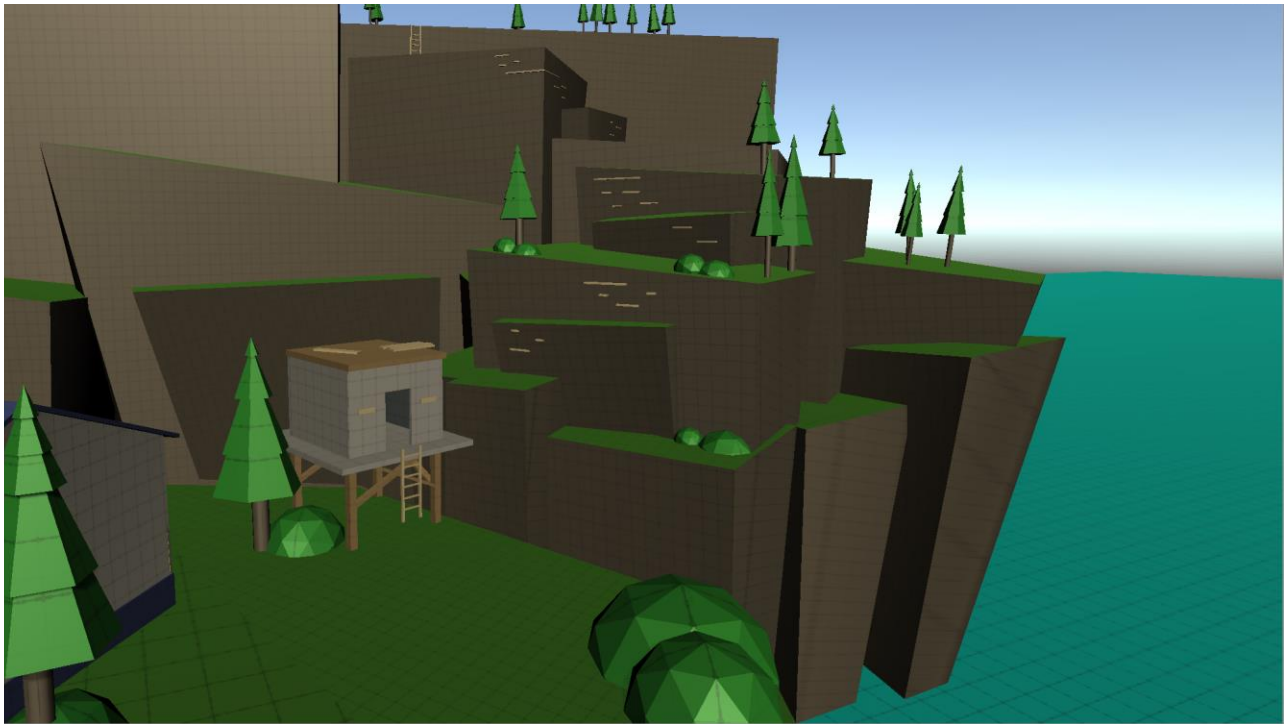


Boom.

We add color to the top of the blocks and suddenly, you’re in a grassy mountainous area with water down below.

As you can see, adding color to your blockmesh helps contextualize the level to playtesters and teammates.

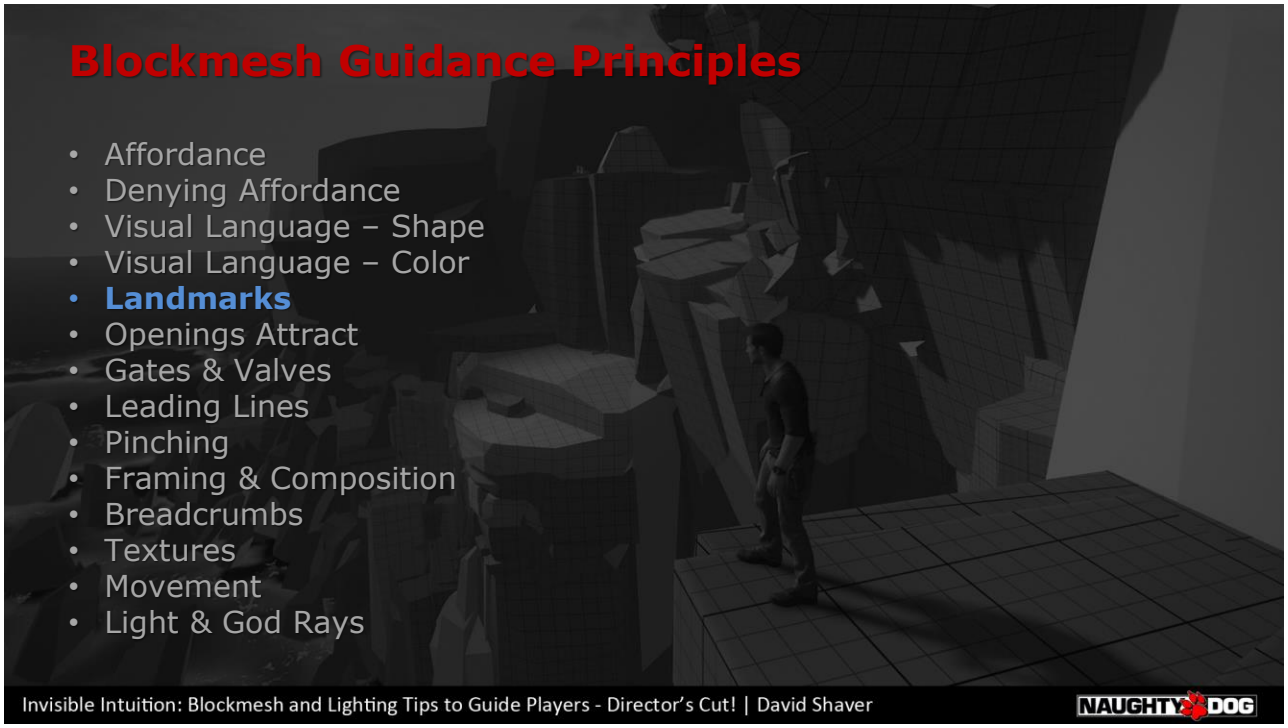
To further ground this on Earth, let’s add some props.



Now, color is important, but it shouldn’t be the only thing you rely on because some players are colorblind.

You should combine color with other techniques – like unique shapes, and using contrasting color values rather than hues.

Bonus points if you can get colorblind playtesters or teammates to help identify problems, and make your game more accessible.



Next tip – landmarks.

(10:37)

VIDEO: Several examples of characters pointing to things in the distance saying “there’s the _____” in Naughty Dog games.

Ever wonder why game characters spend so much time pointing to things in the distance?

That's because they're landmarks, and they're a great way to orient players in your world.

Landmarks (aka weenies)

- Orients players.
- Distant object seen from many vantage points in the level.

A landmark is basically just a big object that can be seen from far away and from different vantage points.

If used correctly, players will see this object over and over as they get closer to it to let them know they're headed in the right direction.

Landmarks (aka weenies)

- Orients players.
- Distant object seen from many vantage points in the level.
- A goal to work toward.

Landmarks also act as a goal for the player to work toward.

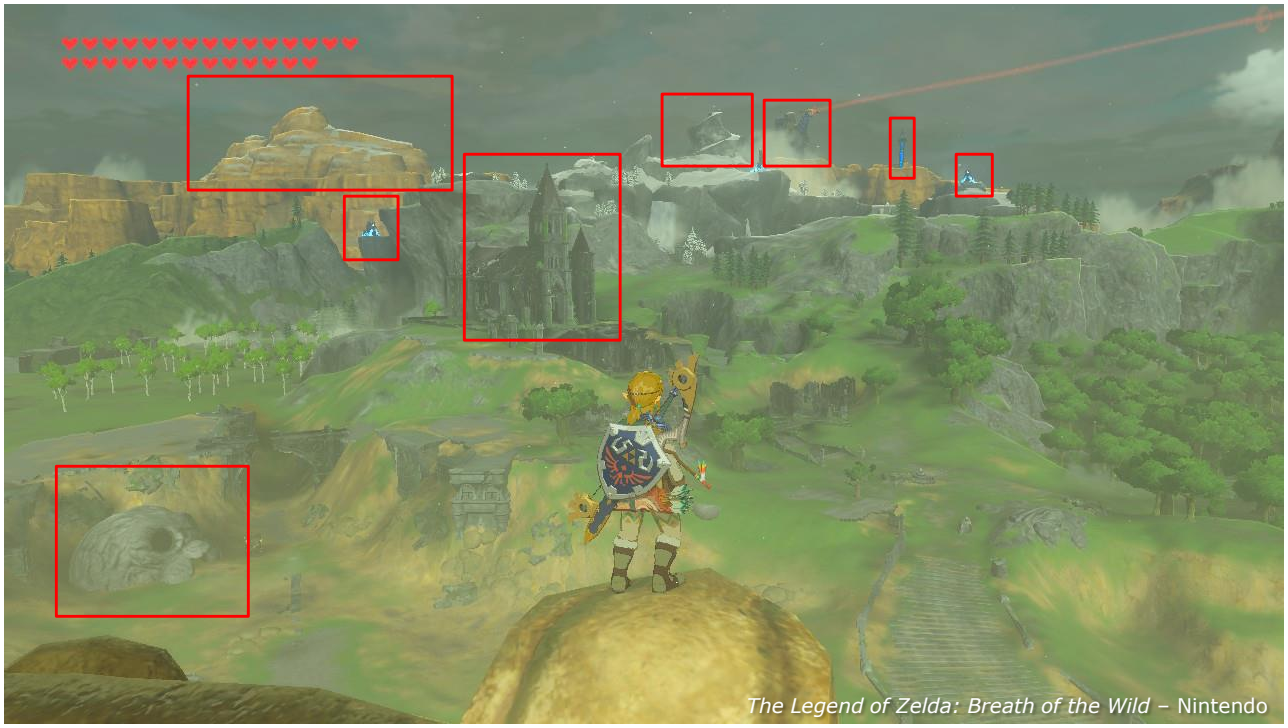
Quick tangent: why are they also known as weenies?

It's a term Walt Disney coined when he noticed his dog would follow his hand wherever it went while holding a hot dog.

Cinderella's castle in the center of Disneyland is the primary weenie. Others are the Matterhorn and Big Thunder Mountain.

He wanted guests to always be able to know where they are in the park just by looking at where the weenies

are.



Check this out.

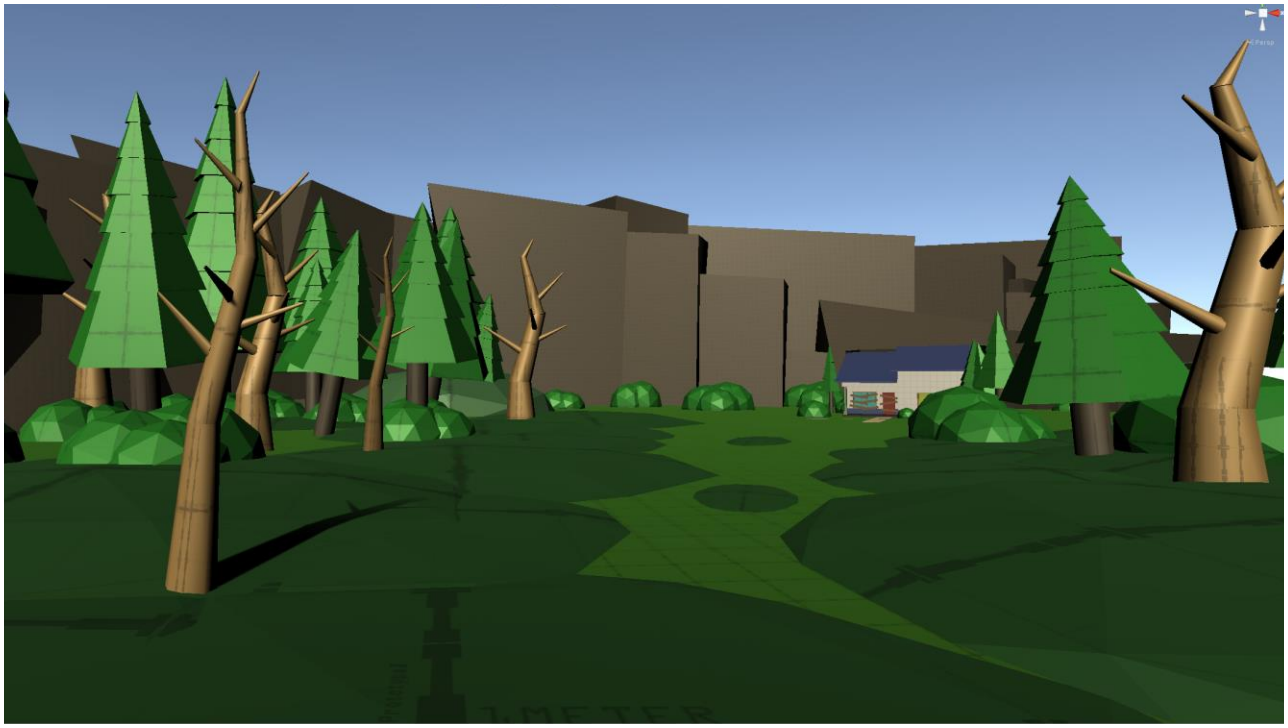
Zelda: Breath of the Wild really goes nuts with the landmarks.

In just this one shot, there are several visible in a row and not overlapping one another.

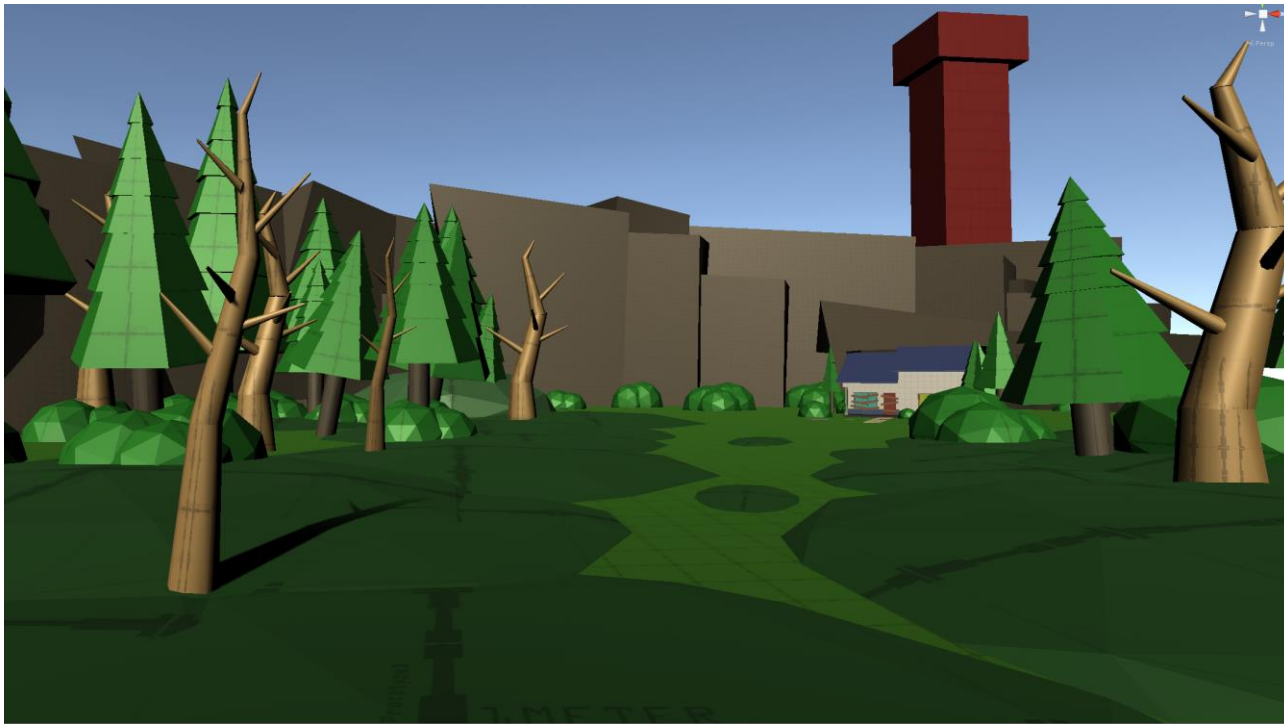
They also have unique silhouettes so you don’t confuse them - which is also a great tip.

Try to have unique silhouettes for things in your game so players can distinguish them at a glance.

OK, blockmesh time.



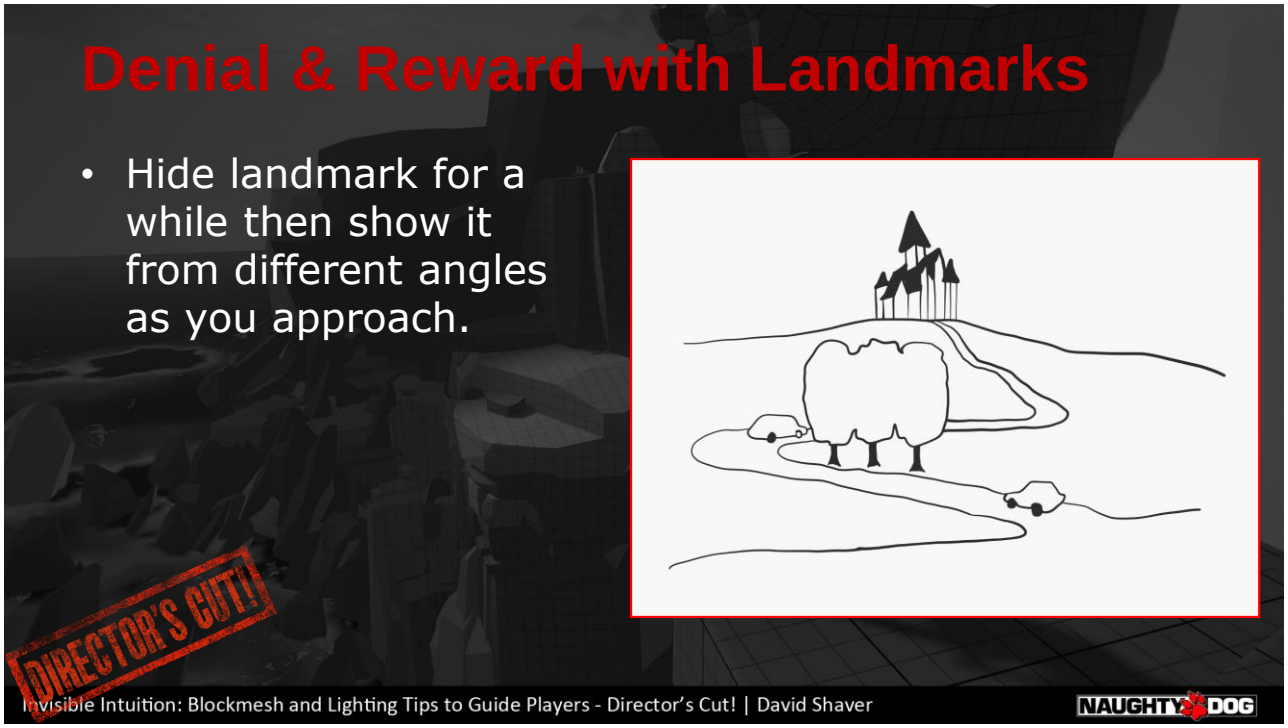
Let’s add a landmark in the distance.



Pretty basic. But it can have a huge impact on drawing players a certain direction.

If I’m working with a landmark, I like to add it first and build the level backwards from there.

That way, I can always see it in the distance and shape the level accordingly.

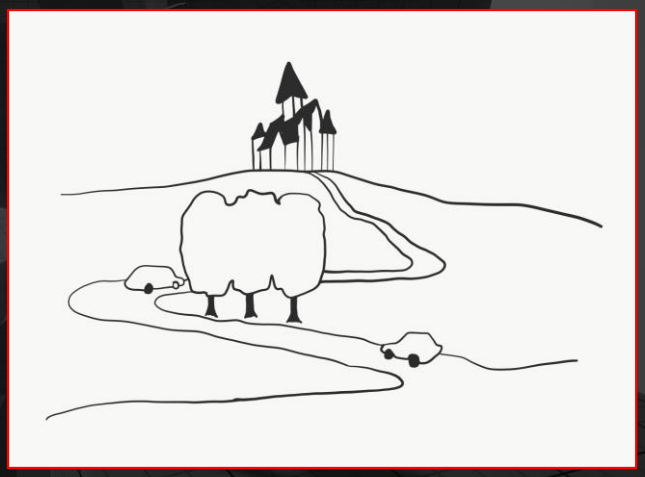


Don't just put a giant tower in the distance and make a level that goes right to it like I just did.

You can use an architectural term called "denial and reward" where you hide the landmark from view and then show it again from different angles as you progress in the level.

Denial & Reward with Landmarks

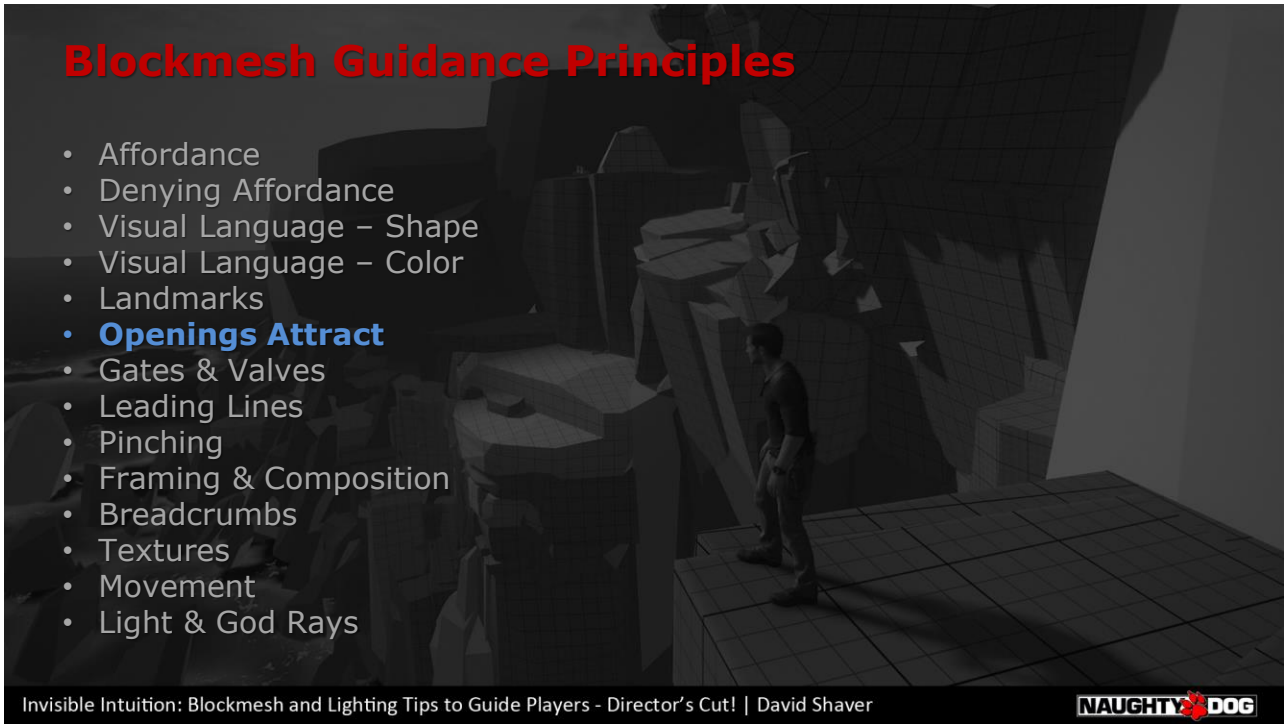
- Hide landmark for a while then show it from different angles as you approach.
- "Denial and Reward" makes the journey more interesting.



DIRECTOR'S CUT!

Do this a few times and it will make the journey feel much more interesting.

Of course there are always exceptions. If you're making a bombastic jeep driving sequence and you need to "get to the choppa" while epic stuff happens all around you, it might be awesome.



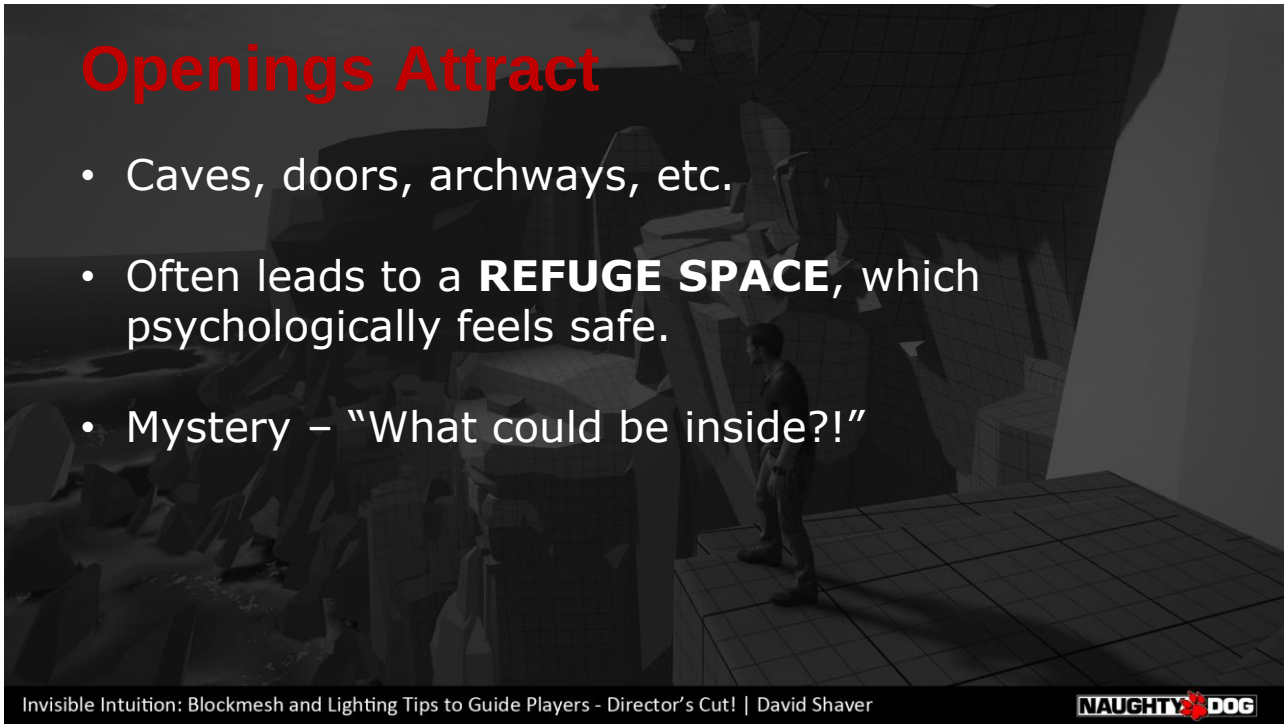
Next tip – openings attract.

(11:59)

Caves, doors, etc.

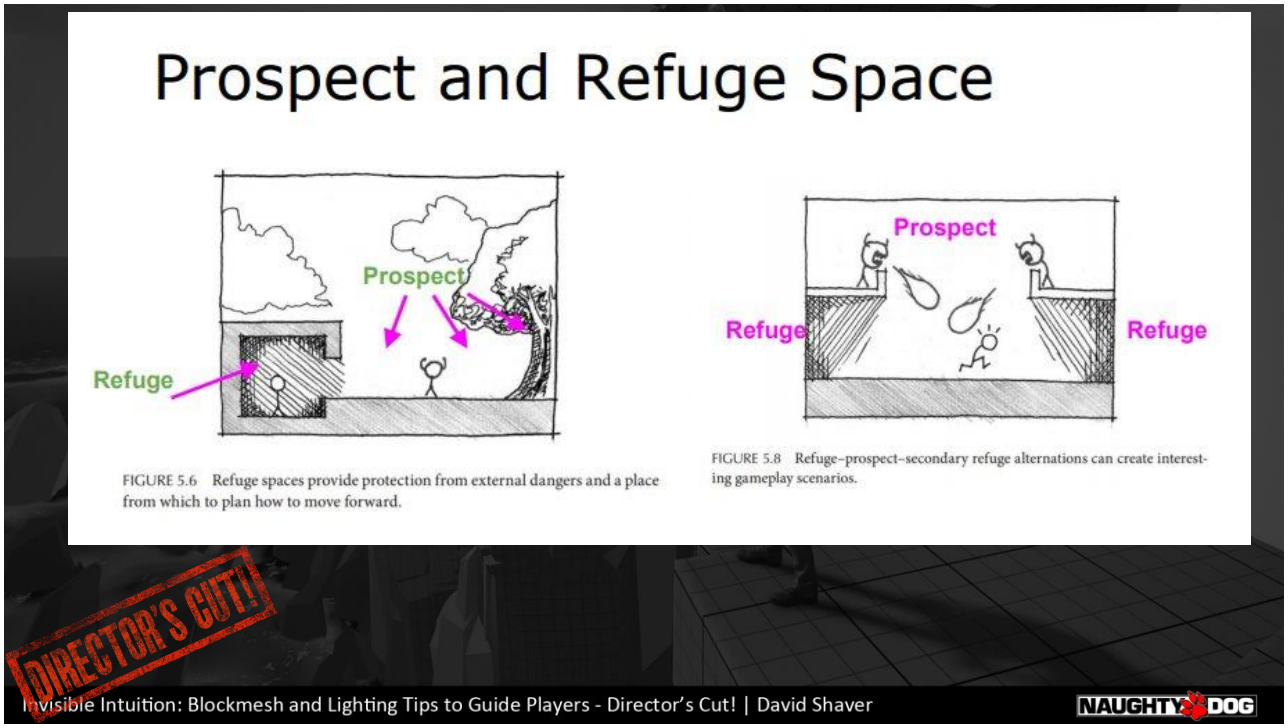
They all seem to attract people toward them.

These openings often lead to a refuge space which psychologically feels safe.



Openings also have an air of mystery about them and people want to see what's inside.

This attraction happens in the real world with hobbies like spelunking and urban exploration.



Openings lead to what Hildebrand called "refuge spaces" in his book Origins of Architectural Pleasure.

They psychologically are safe.

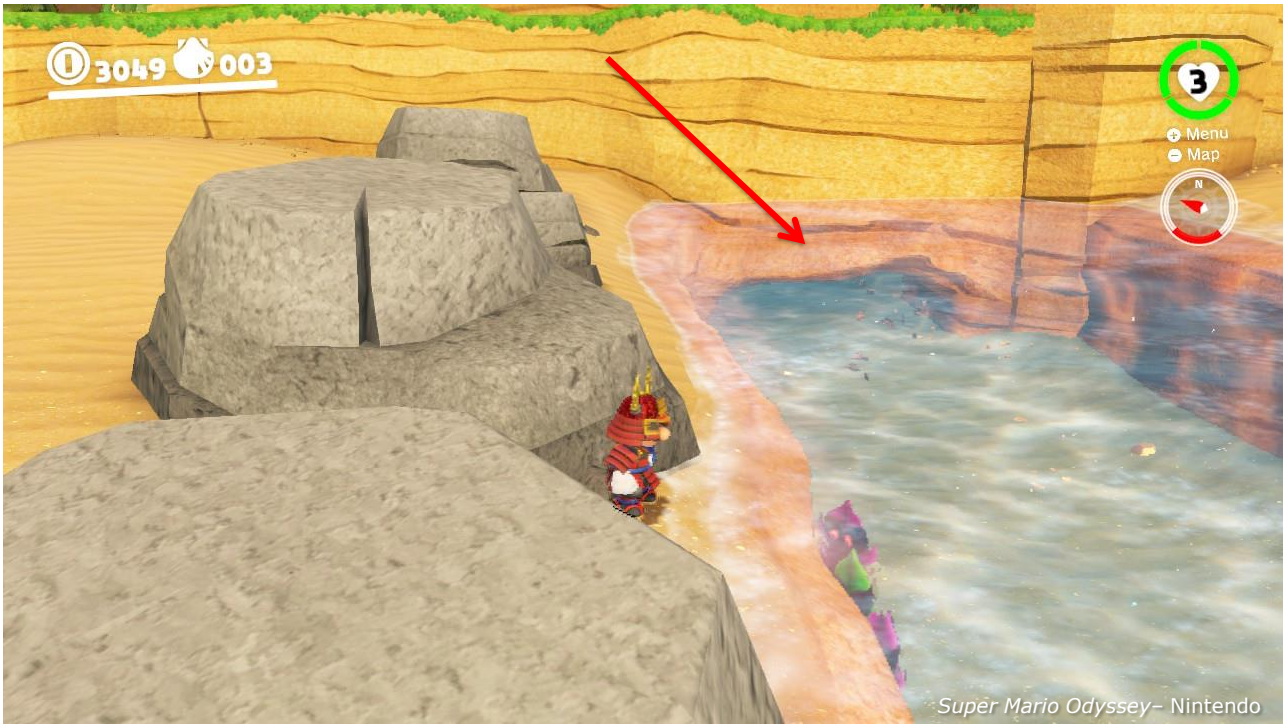
Prospect spaces, by contrast, feel open and potentially dangerous.

This image from Christopher Totten's book, An Architectural Approach to Level Design, illustrates this concept

nicely for games.

Titanfall 2 – Respawn Entertainment

Here in Titanfall 2, a ramp affords jumping to a nicely lit opening that begs to be explored.



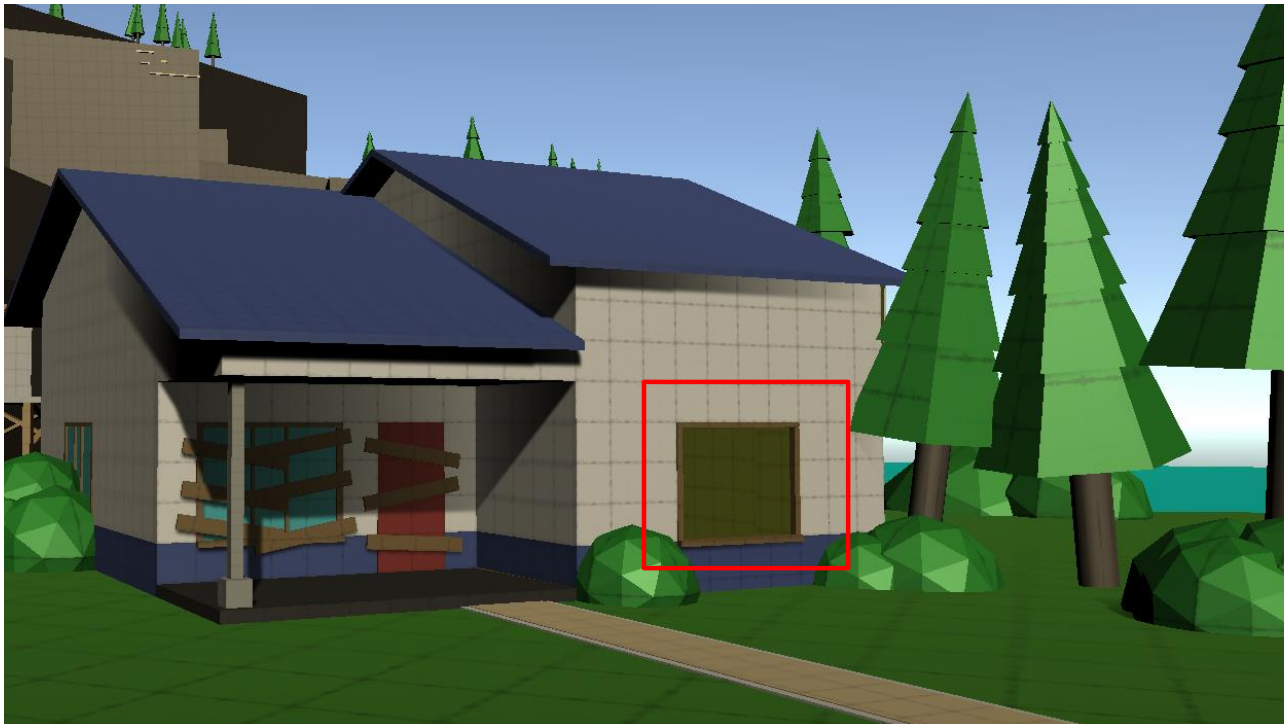
This underwater opening lets you know there’s something beyond if you swim for it.

It even works in block worlds!

As soon as I saw this, I went right for it.

Doors and archways also draw you inside even though an archway may not have a roof beyond it.

Sometimes, even a busted tree on a rock can make you feel compelled to go under them and draw you through the level.



When adding openings to blockmesh, it’s important to have different colors for interior and exterior walls.

Here we have a cool white exterior and a warm yellow interior.

This helps players read depth in your blockmesh. If they’re the same color, it’s hard to tell it’s even an opening.

Also, communicate this design intent to your artists to ensure THEY know this is an entrance, and needs to stand out.

Blockmesh Guidance Principles

- Affordance
- Denying Affordance
- Visual Language – Shape
- Visual Language – Color
- Landmarks
- Openings Attract
- **Gates & Valves**
- Leading Lines
- Pinching
- Framing & Composition
- Breadcrumbs
- Textures
- Movement
- Light & God Rays

Next tip – Gates and

(13:03)

Blockmesh Guidance Principles

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Valves!

Blockmesh Guidance Principles

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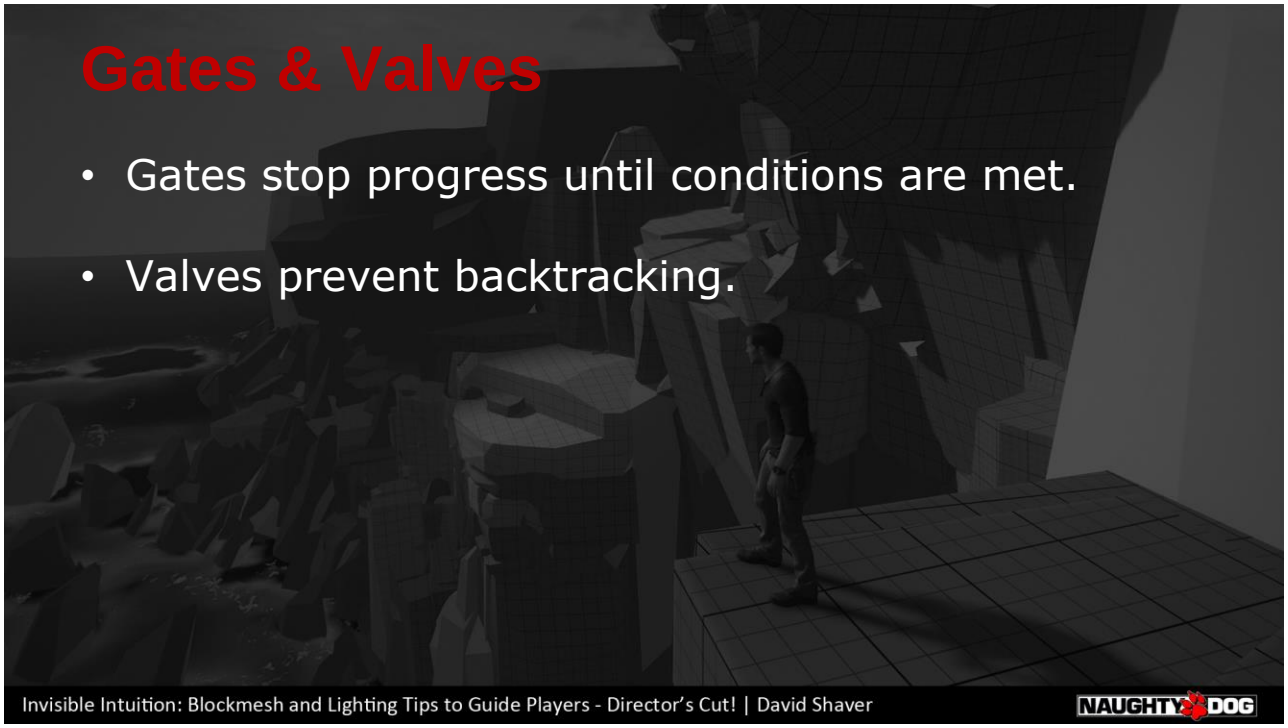
- Breadcrumbs
- Textures
- Movement
- Light & God Rays

No, not those Gates & Valves!

The kind that makes WAY less money.

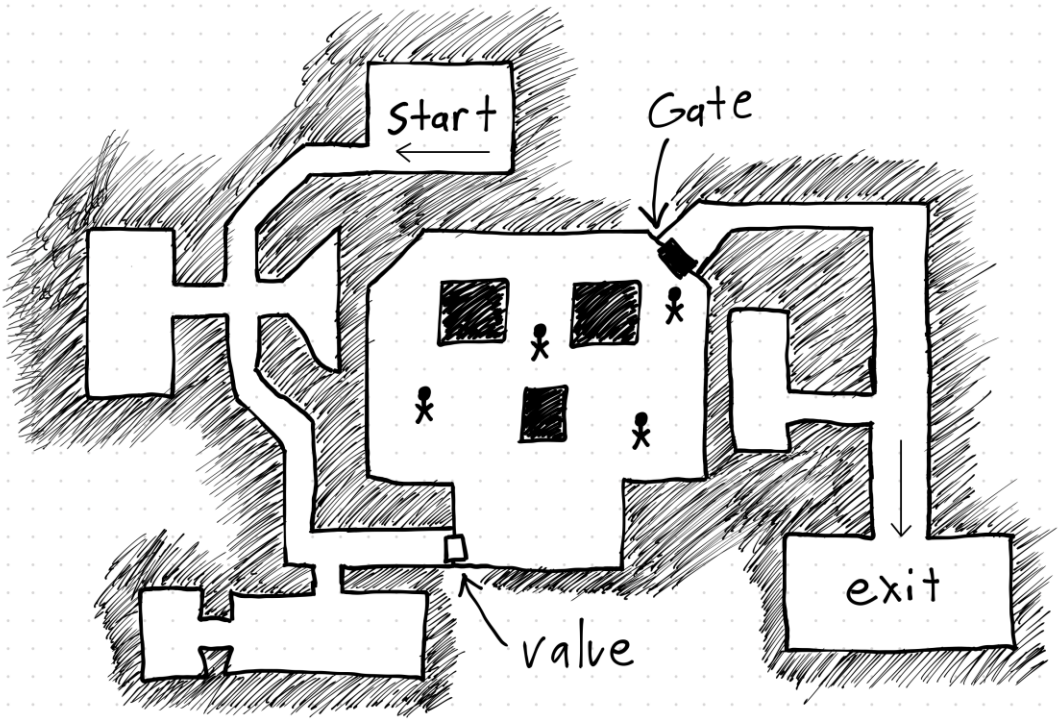
We want the level design kind!

Gates stop progress until some sort of conditions are met: you've killed all the enemies, you've moved the debris out of the way, etc.



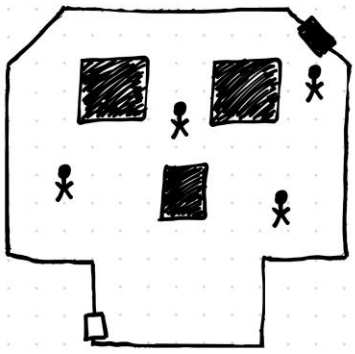
Valves are the opposite.

They let players move forward and then slam the door shut behind them so they can't backtrack.



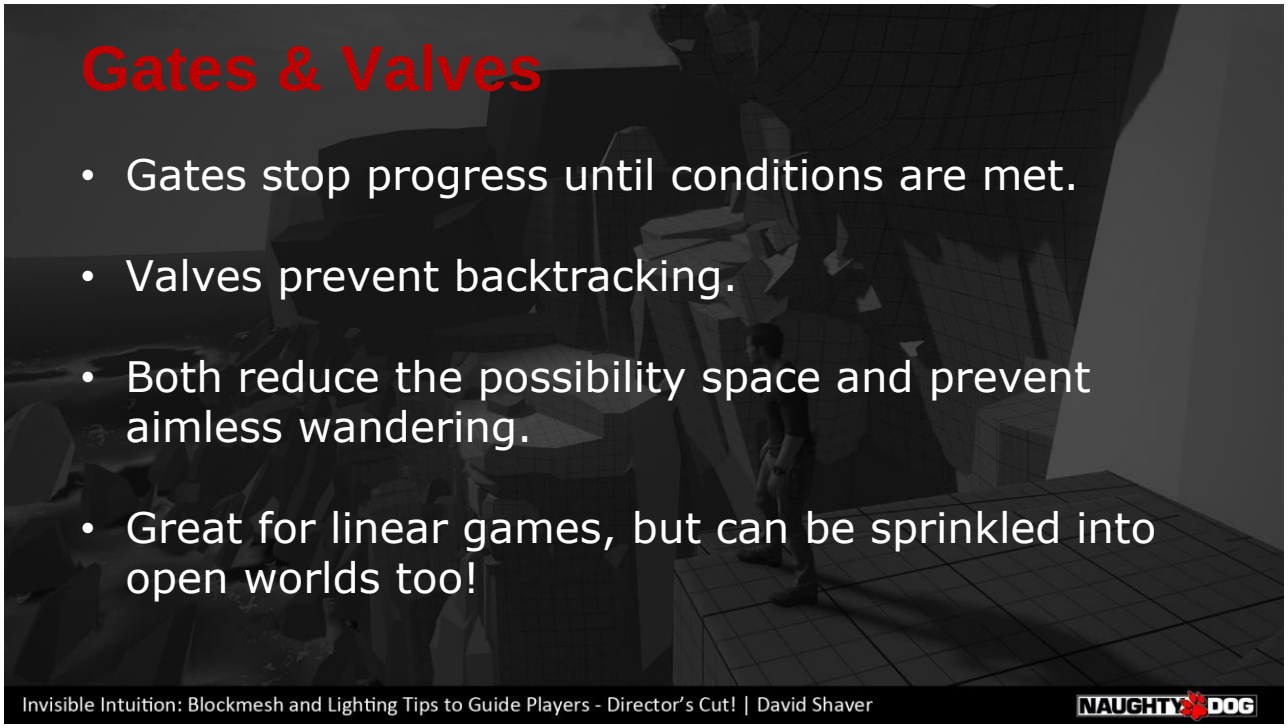
In this scenario, we want the player to enter the combat space and be trapped until combat is over.

We have a valve INTO the space and then a gate at the other end to block them.



Once they enter, the gates and valves reduce the possibility space of the world to just the combat zone.

Also, there’s less to mentally keep track of, so players can focus on the task at hand.



It may look like this is only useful for linear games, but open world games can use them too with scenarios like arena battles.

The Halo series did a great job of having big open levels that also gated and valved players when needed.

Lets look at an example of both a gate and a valve.

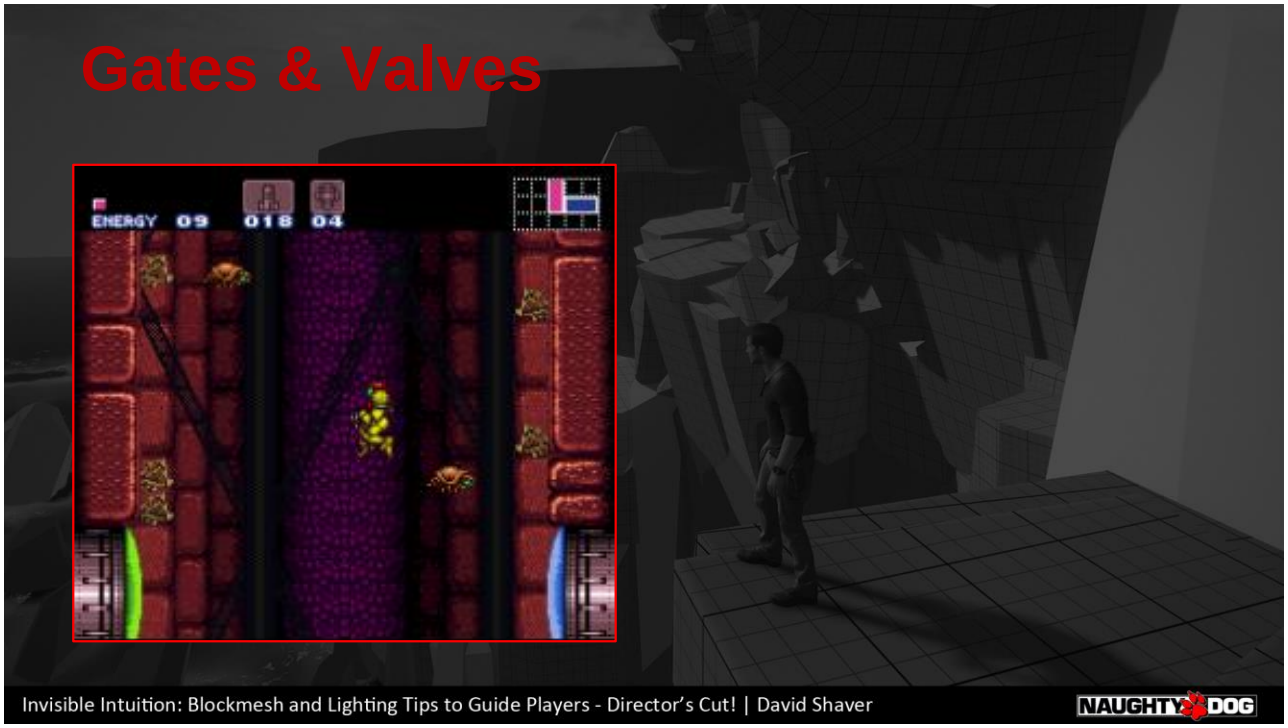
You can’t progress until you move the vines and then they close the passage behind you.

Video: Chloe and Nadine pull open roots to pass through. The roots close up behind them.

Gates are pretty straightforward - something’s blocking you until you clear it - so I’ll focus on valves which can be more nuanced.

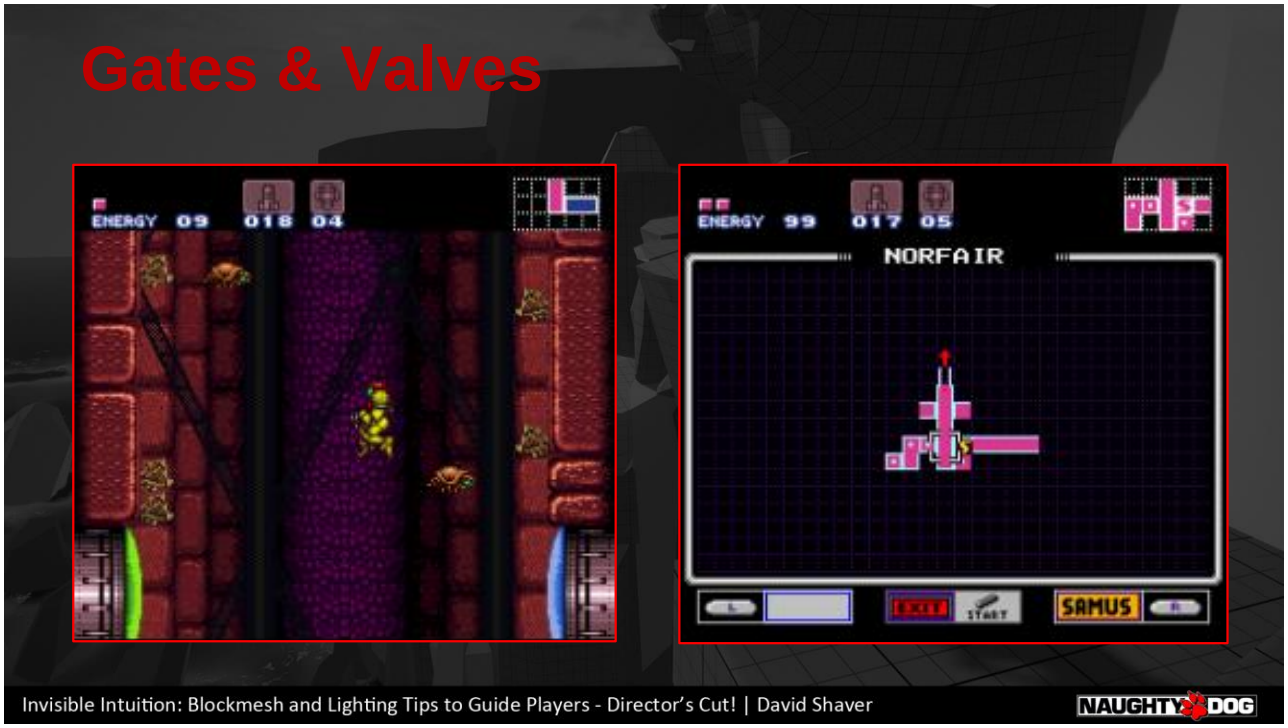
In this valve example video, you drop down and can’t get back up. You can only move forward.

VIDEO: Joel and Ellie drop down from the top of a bus and can’t climb back up.



A fairly famous valve is in Super Metroid, where an entire chunk of level acts like a valve.

At some point, the player falls down this really long shaft and there's no way back up.

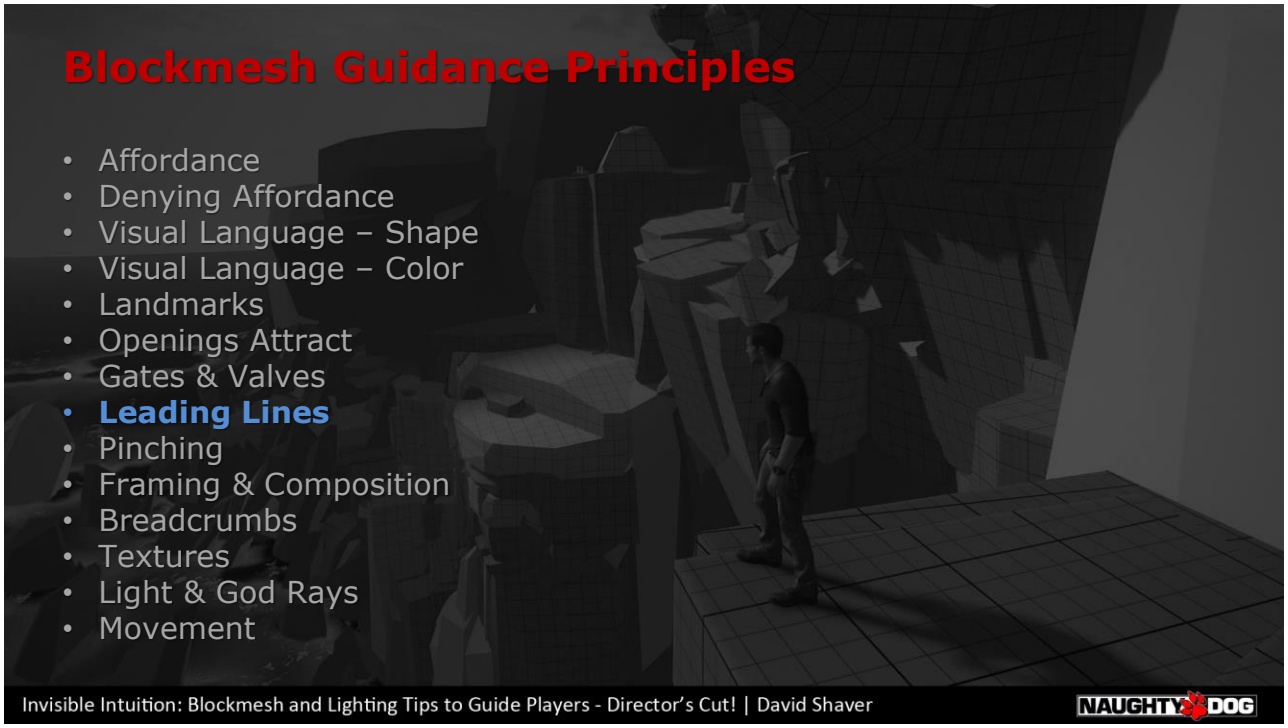


They're stuck, and the vast possibility space of the game is reduced to this tiny portion as seen on this map.

IN this space, they find two critical items: the High Jump Boots and Ice Beam, and learn they can freeze enemies and high jump off of them to escape the shaft.

The shaft that was once a VALVE is now a GATE to overcome.

Given the entire world to explore, they may never have discovered this ability.



Next tip – leading lines

(15:00)

Leading Lines

- Lines that draw your eye to the intended point of interest.

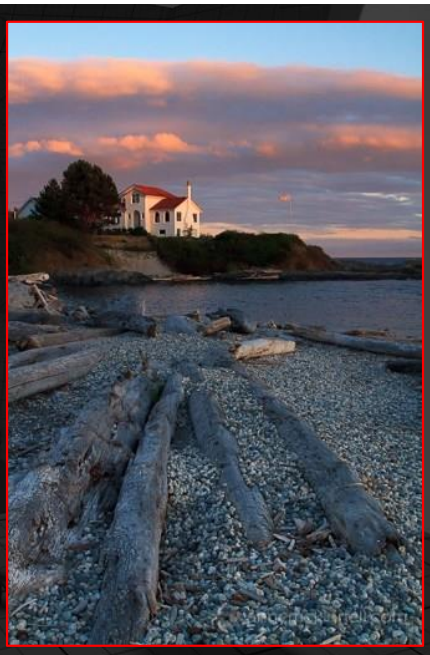


Image Source:
https://digital-photography-school.com/how-to-use-leading-lines-for-better-compositions/

Leading lines are a composition technique where lines in the environment draw the eye to a specific place in the scene.

Leading Lines

- Lines that draw your eye to the intended point of interest.

Image Source:
https://digital-photography-school.com/how-to-use-leading-lines-for-better-compositions/

In this photo, the logs draw the eye up and into the frame to finally rest on the house.

Leading Lines

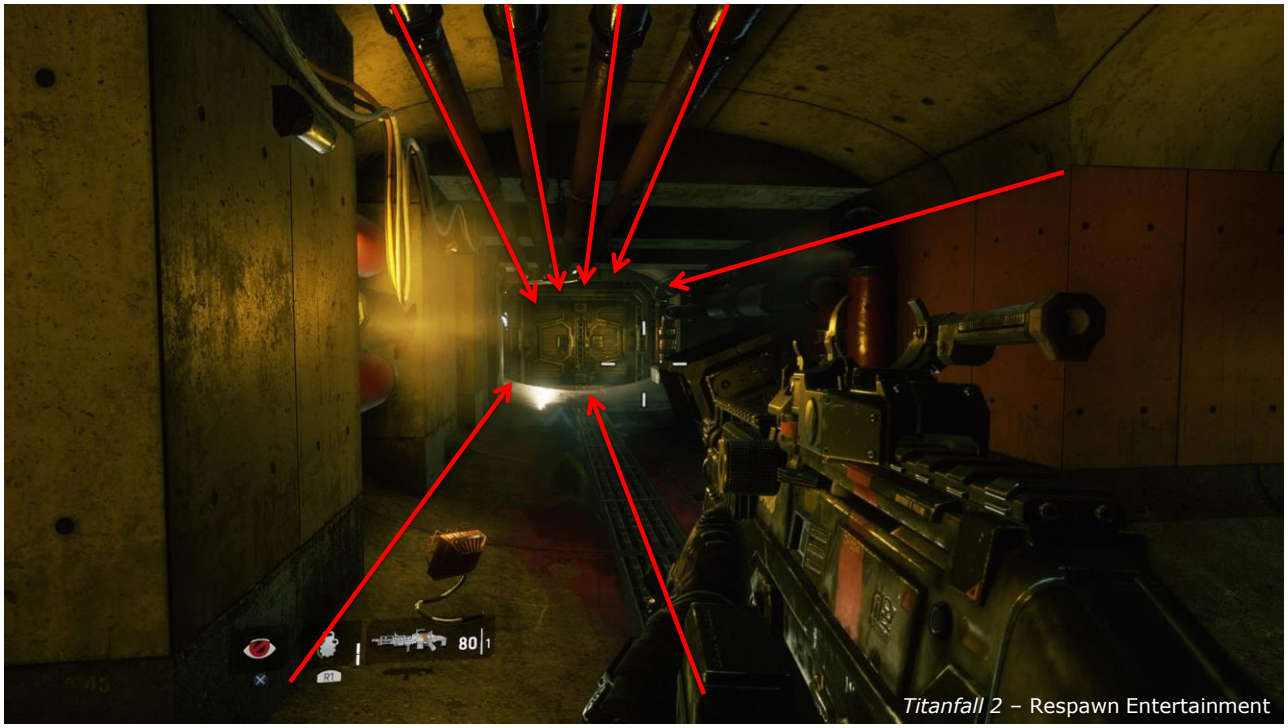
- Lines that draw your eye to the intended point of interest.
- Roads, pipes, cables, etc.

Image Source:
https://digital-photography-school.com/how-to-use-leading-lines-for-better-compositions/

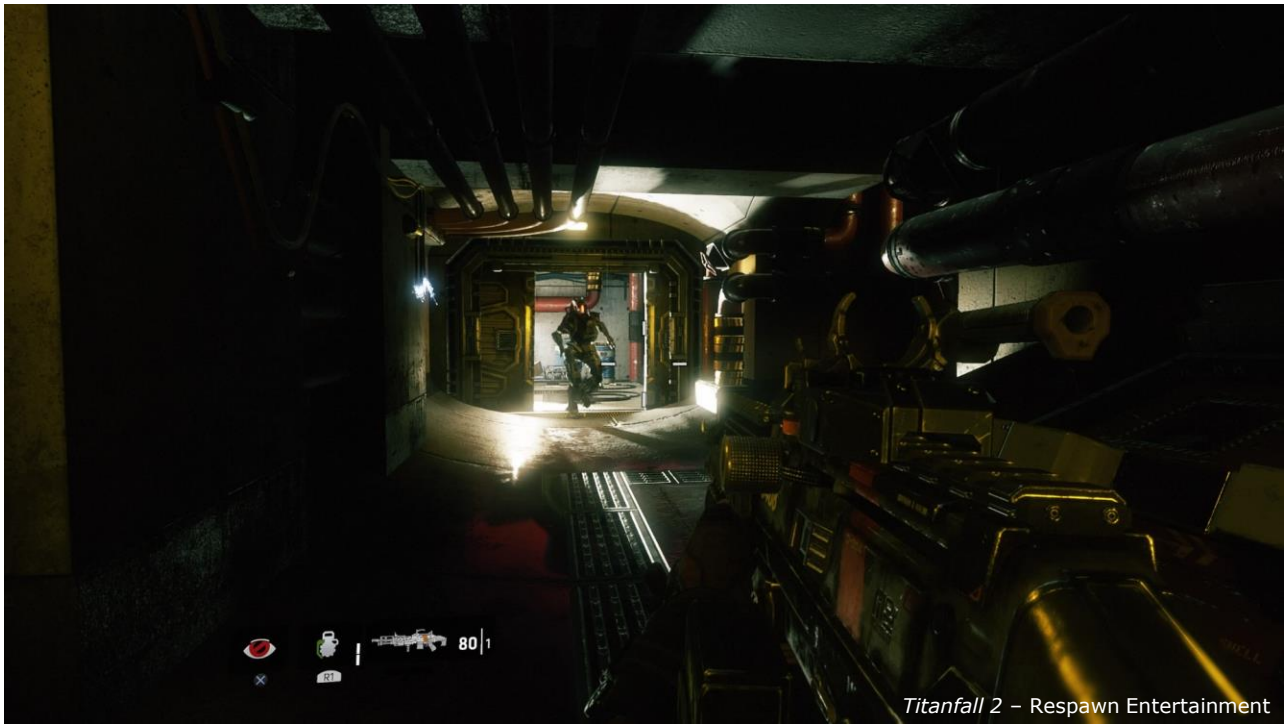
In games, these are often roads, pipes, cables, and all sorts of things.

Titanfall 2 – Respawn Entertainment

Here in Titanfall 2, we wanted the player to focus on this door and not miss the reveal of a new enemy.



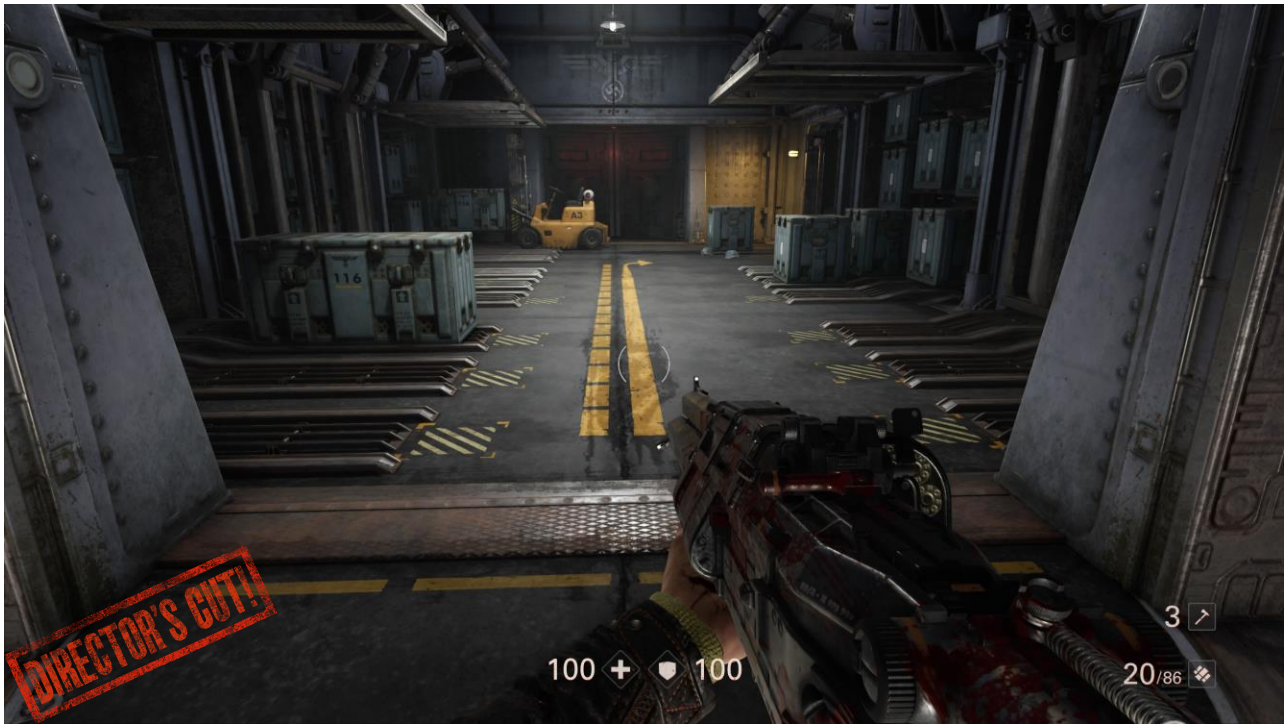
Pipes and floor grates form leading lines to the door.



Titanfall 2 – Respawn Entertainment

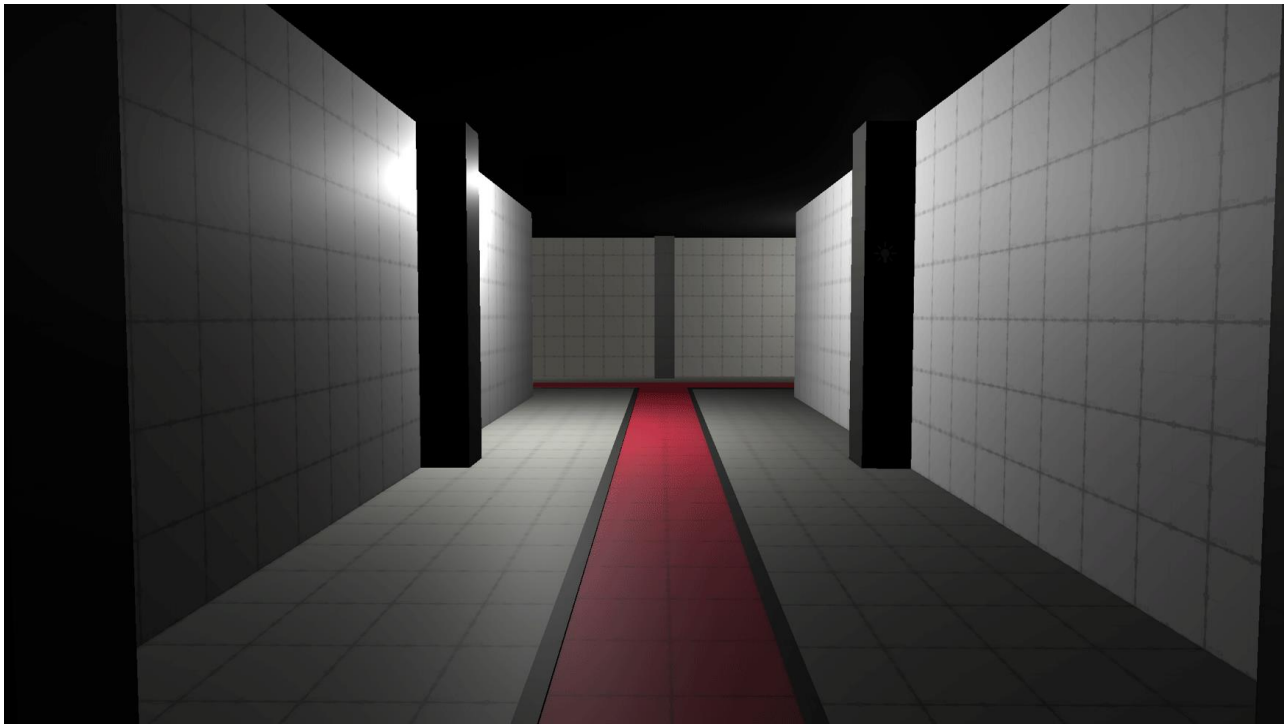
When you get close, a Stalker rips the door open for a grand reveal.

Cables on the floor are a game trope at this point, but they work.



As do brightly painted lines and repeated geo that form lines on the sides.

If you squint your eyes, the yellow line down the middle, the forklift, and the yellow wall will pop out. All guiding you to the right.

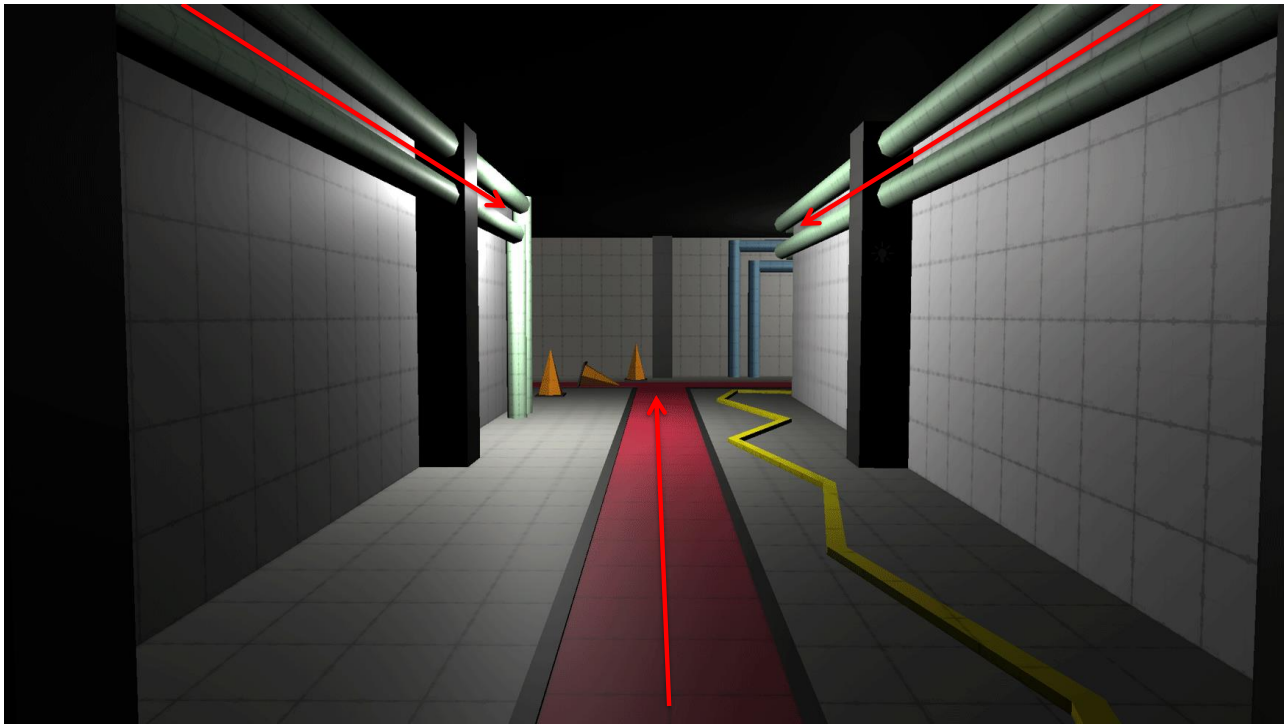


Here in the blockmesh, is a hallway with a T junction at the end.

Let’s say you want the player to go to the right.

Right now, it’s a coin toss.

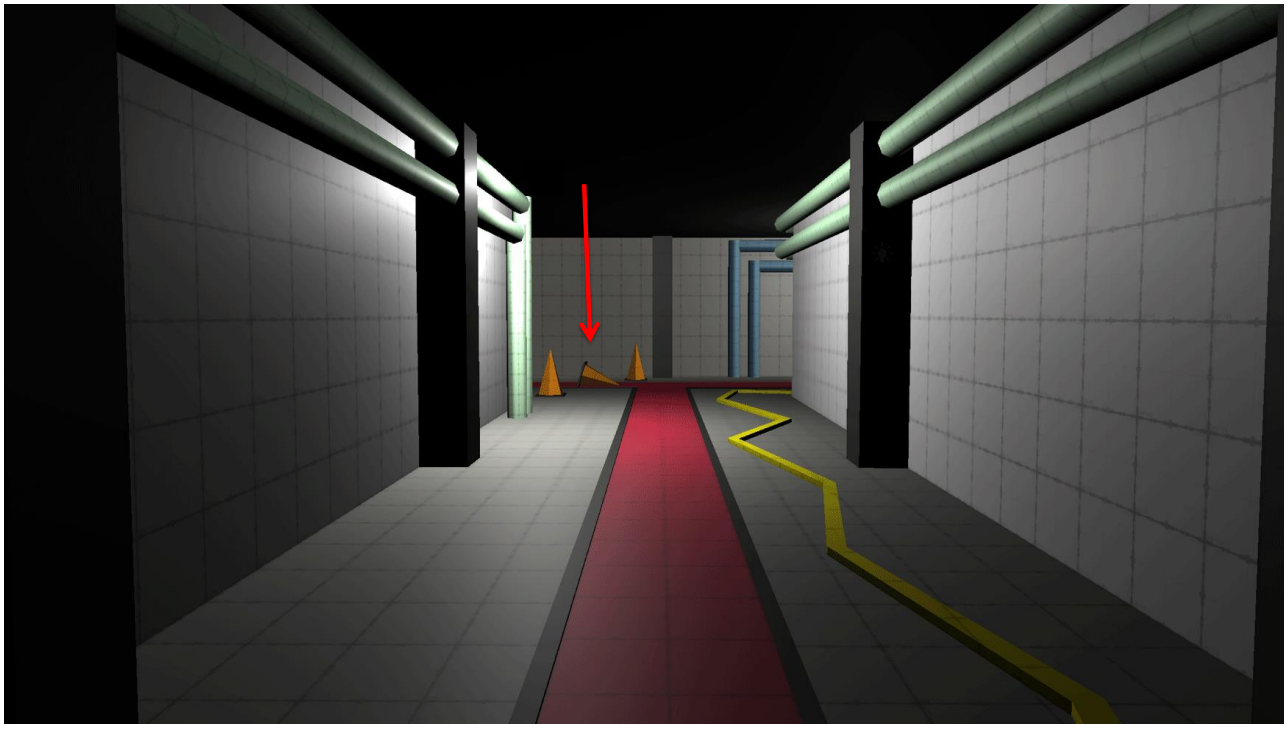
They may turn left, see a locked door and have to turn around, or they may turn right and go into the next area.



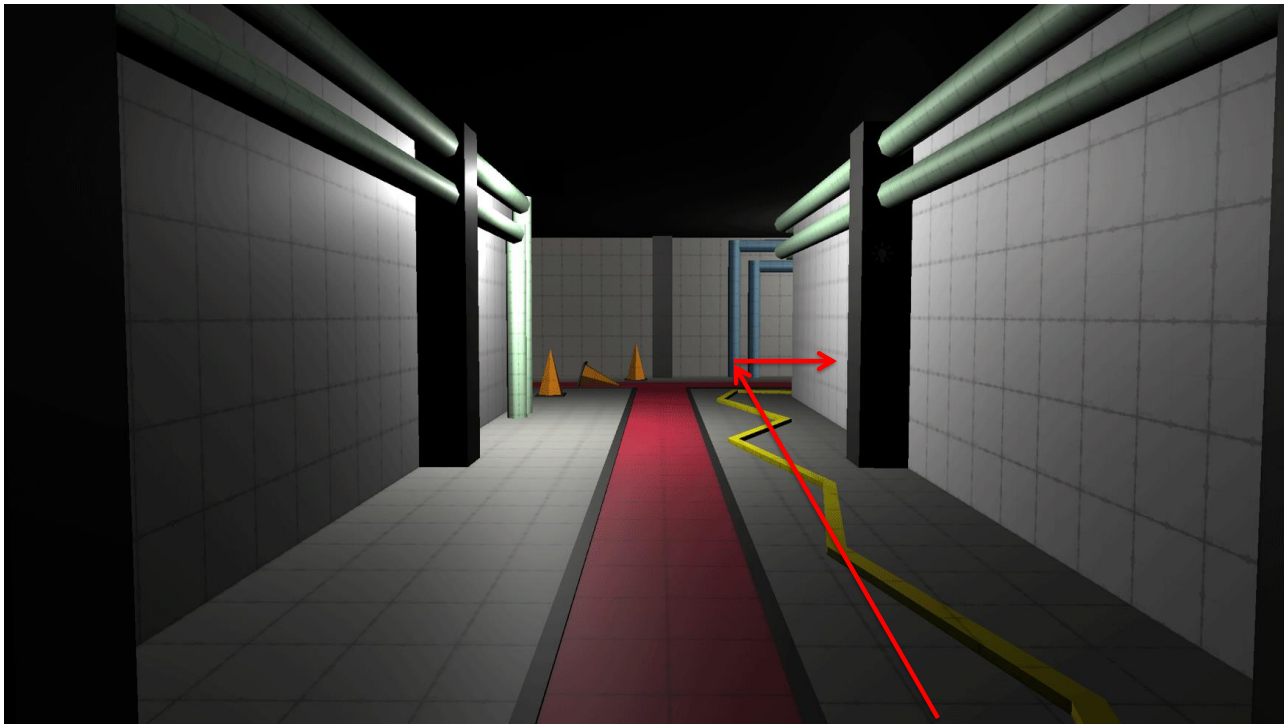
By adding some leading lines, we can draw their attention to the right and increase the chances they go there.

Pipes on the walls and a rug guide the eye down the hallway.

But, the pipes on the left stop while the pipes on the right go around the corner, leading the eye.

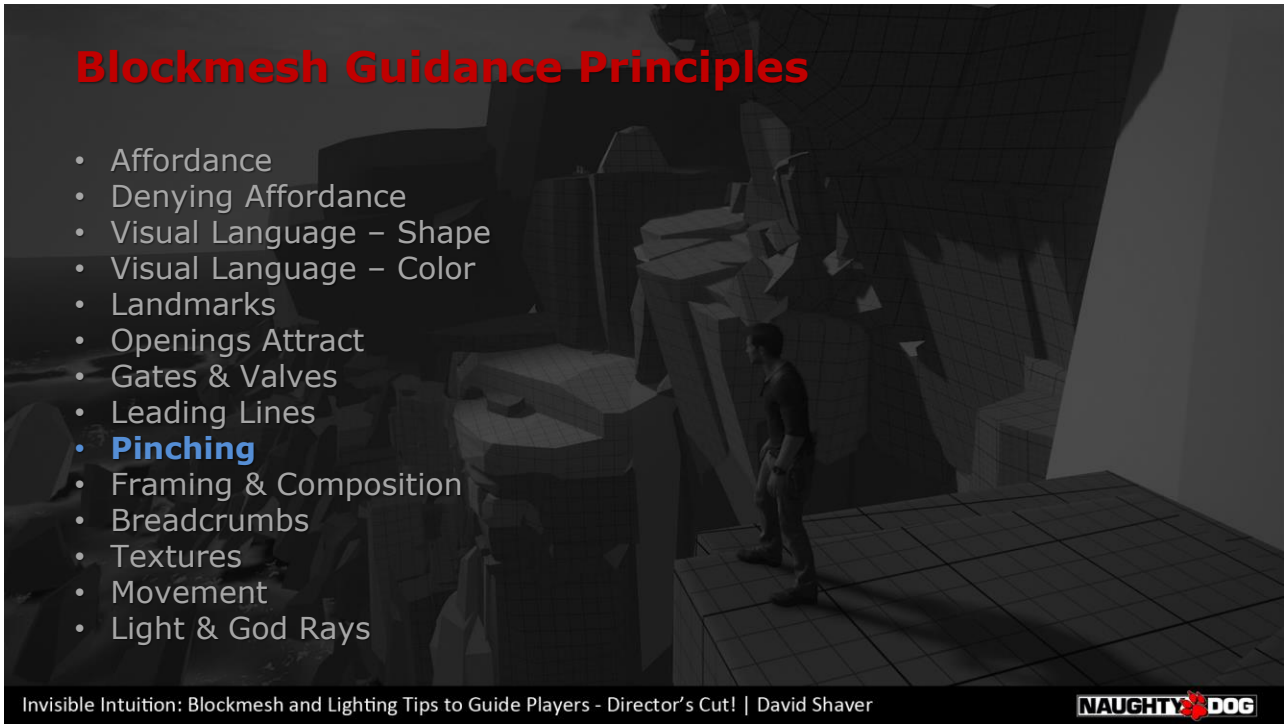


The caution cones break up the red line of the rug going left.



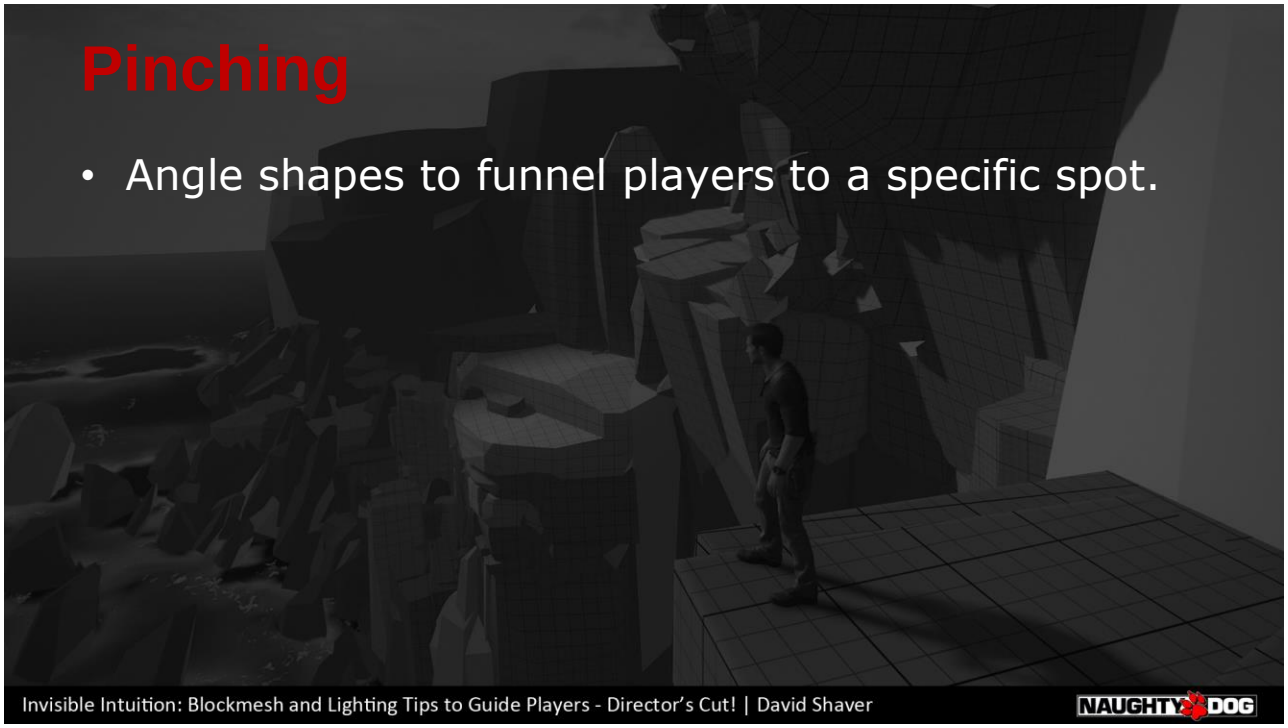
And to go over the top, we add a bright yellow cable that hugs the right side and goes around the corner.

Just simple shapes, but it can have a huge impact on smooth navigation and playtests.



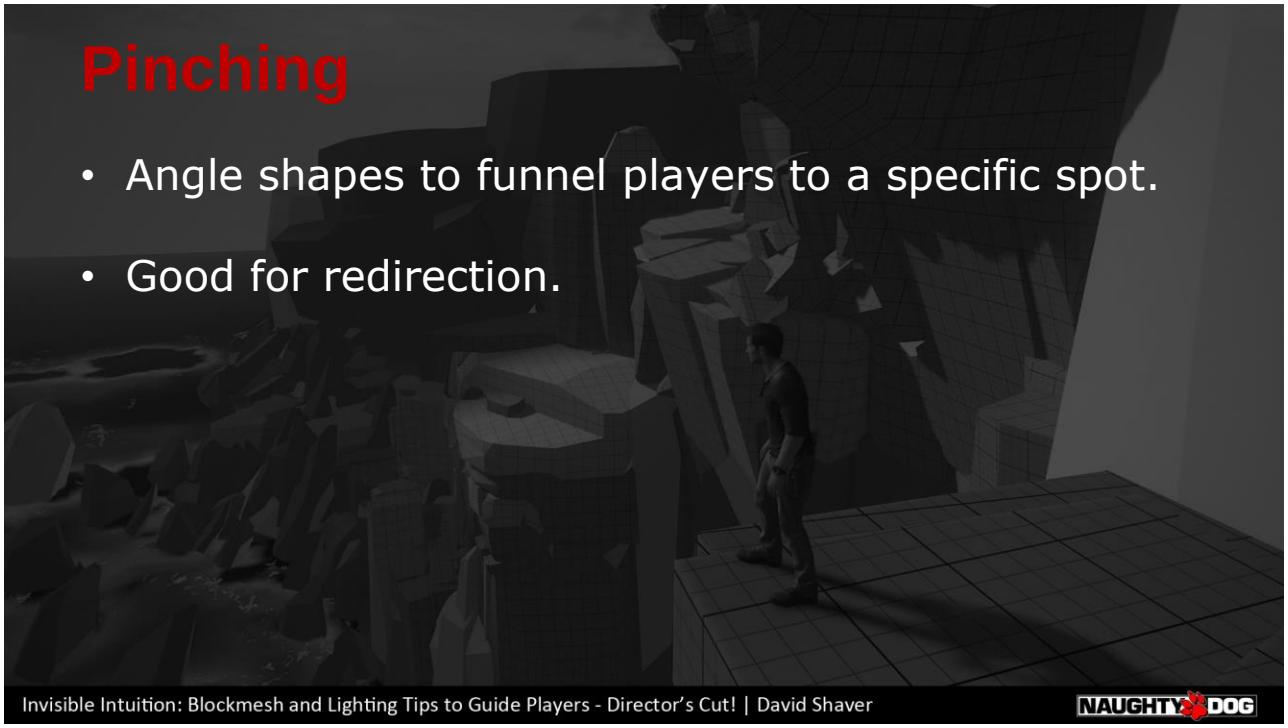
Next tip – pinching.

(16:15)

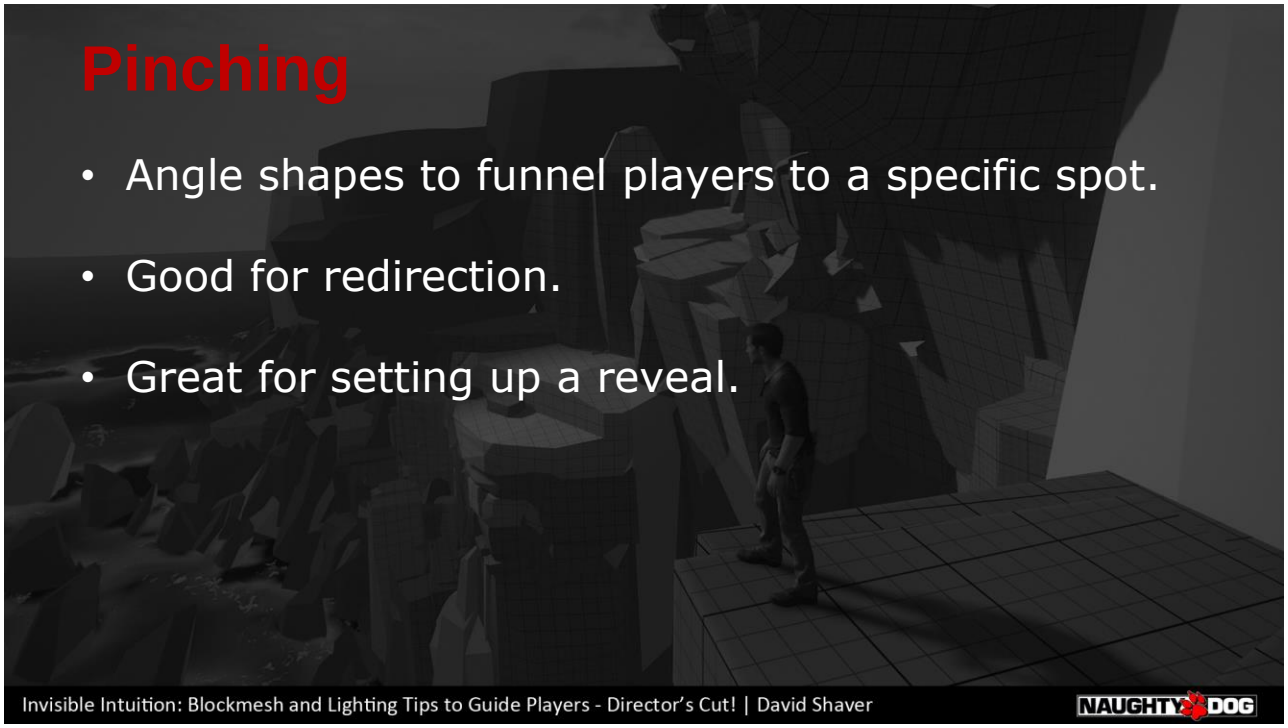


Pinching basically means your layout funnels the player to a specific spot.

You accomplish this by blocking off areas and angling shapes to naturally flow to that spot.

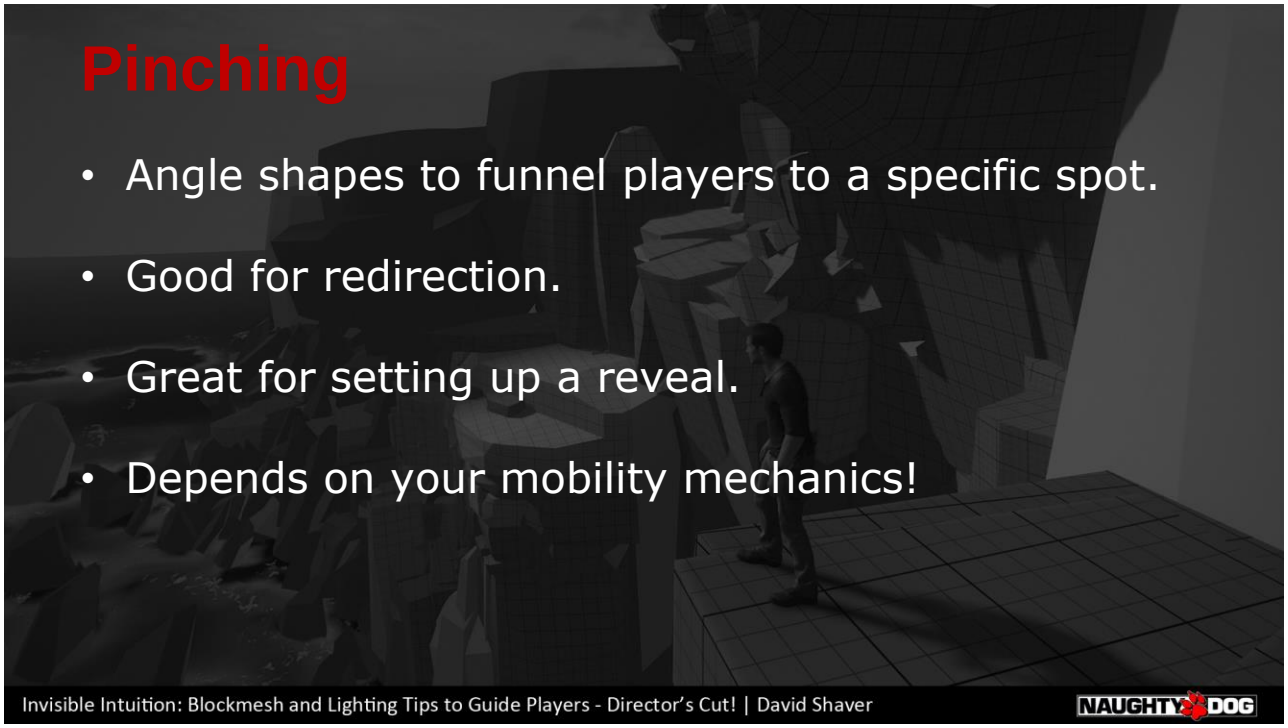


It's good for redirecting players to a specific area.



It's also a great way to setup a cool reveal like the view of a landmark without forcing the camera to look at it.

If you pinch them to a specific spot, the camera will be naturally pointed at the thing you want them to see.



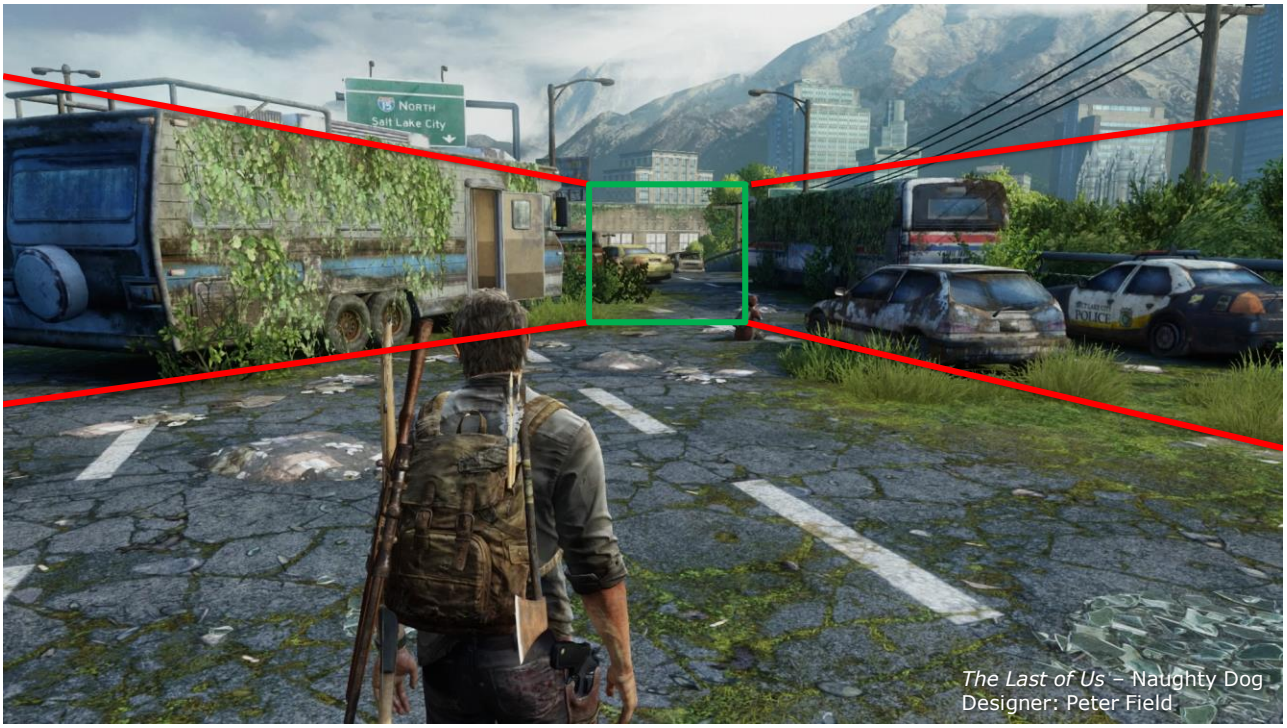
Of course, all of this completely depends on your mobility mechanics.

It's MUCH easier to do this in a game where players are stuck on the ground than in something like Titanfall where players are flying all over the place.

Let's look at an example.

The Last of Us – Naughty Dog
Designer: Peter Field

Here, the buses and cars are angled to a specific spot.



Which you can see highlighted here.

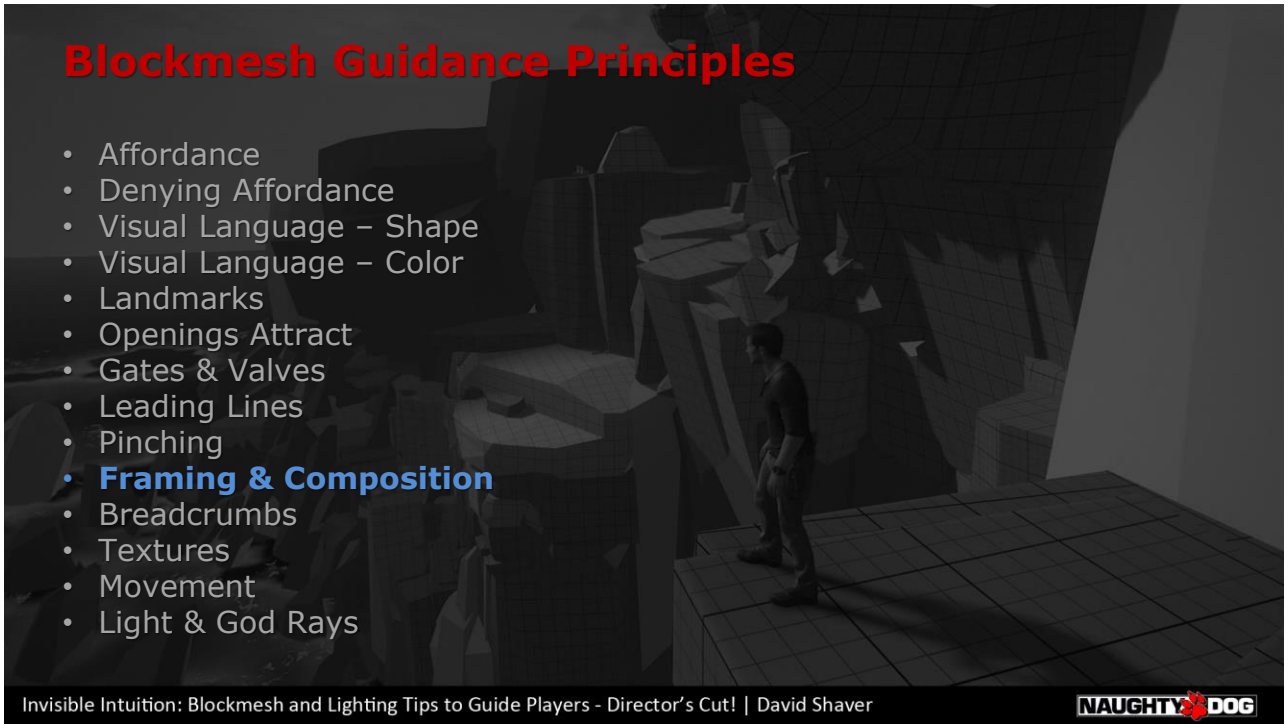
The Last of Us – Naughty Dog
Designer: Peter Field

Walking down the street, the shapes naturally bring you to the end of the pinch which faces the way forward.

Let’s see it in action.

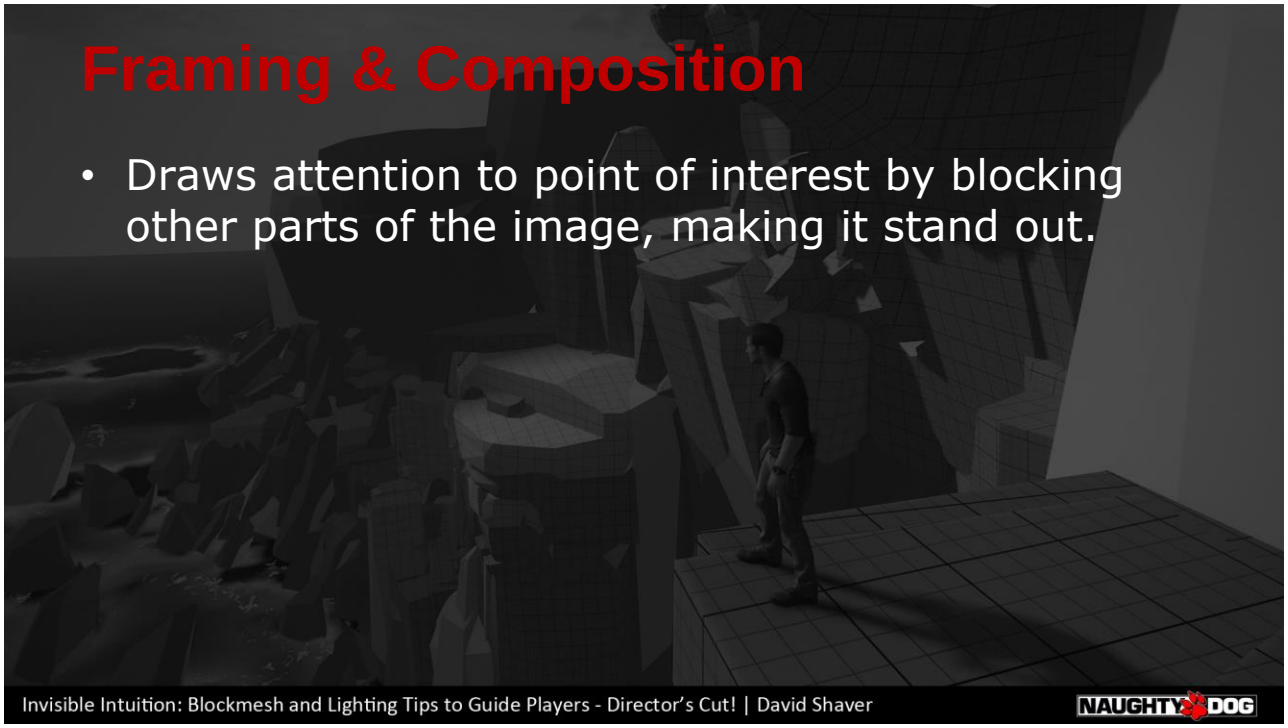
In this video, the pinch lines up a perfect shot of the hospital in the distance (which is your goal) and the tunnel that takes you there.

VIDEO: Joel and Ellie move toward the bus and wall which forces them to look at the hospital and tunnel.



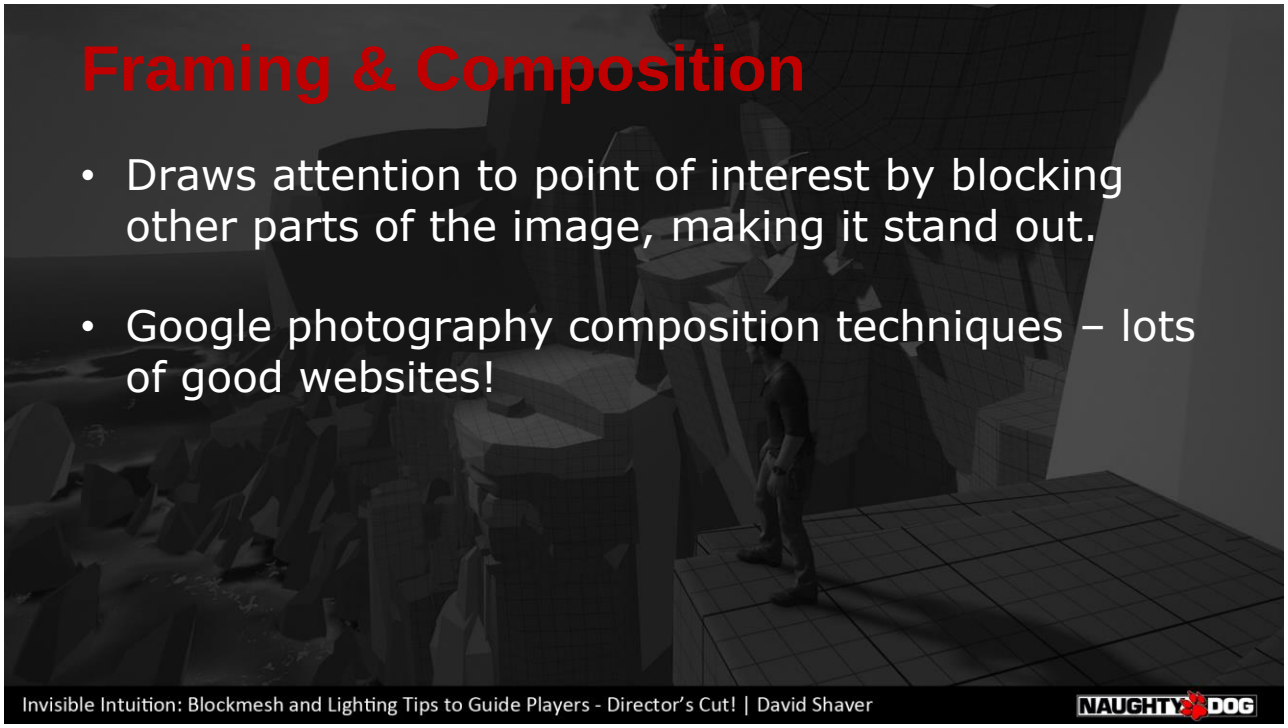
Next tip – framing & composition.

(17:28)



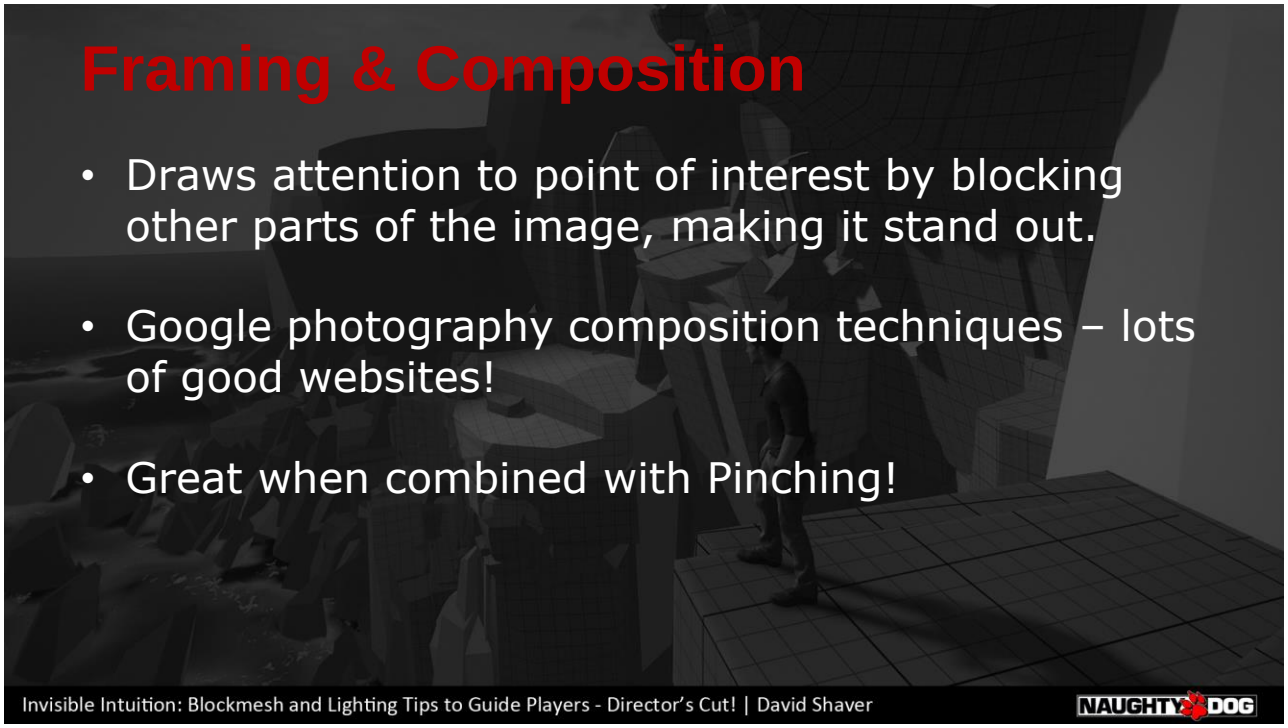
Another technique borrowed from photography.

By framing your subject (a landmark, a big enemy, a cave opening, etc.), you draw attention to it.



If you'd like to learn more, just Google photography composition techniques.

There are tons of good free resources and examples.



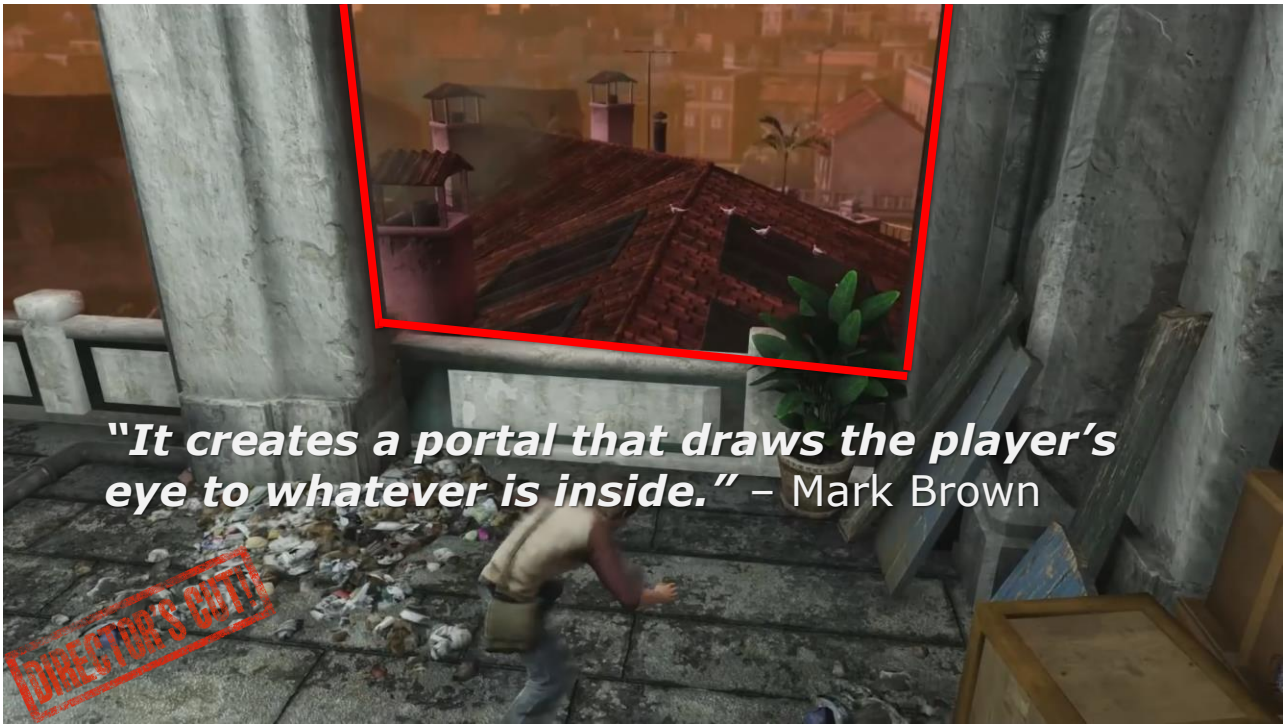
This one is really useful when combined with Pinching to setup an important reveal in the level.

After you pinch the player to a specific spot, perfectly frame the object for maximum effect.

Let's see it in action.

During a dramatic escape sequence, you don’t want the player getting lost or the excitement will die.

Here, the designer framed the rooftop and even put a leading line down the center to draw you into the opening.



As Mark Brown said in his Game Maker's Toolkit video, "it creates a portal that draws the player's eye to whatever is inside."

Here’s one from Lost Legacy. The player’s goal is the Pink Lotus hotel.

And the logo is perfectly framed between two vertical banners in the opening.

VIDEO: Joel follows the winding path up a hill with a river to the left and a big rock formation on the right. The rocks occlude the dam until Joel is facing it perfectly for the reveal.

As you saw, the player is naturally pointed at the dam and due to good framing, it was the dominant thing on the screen.

Also, side tip, people’s eyes are drawn to detail and the dam very detailed.

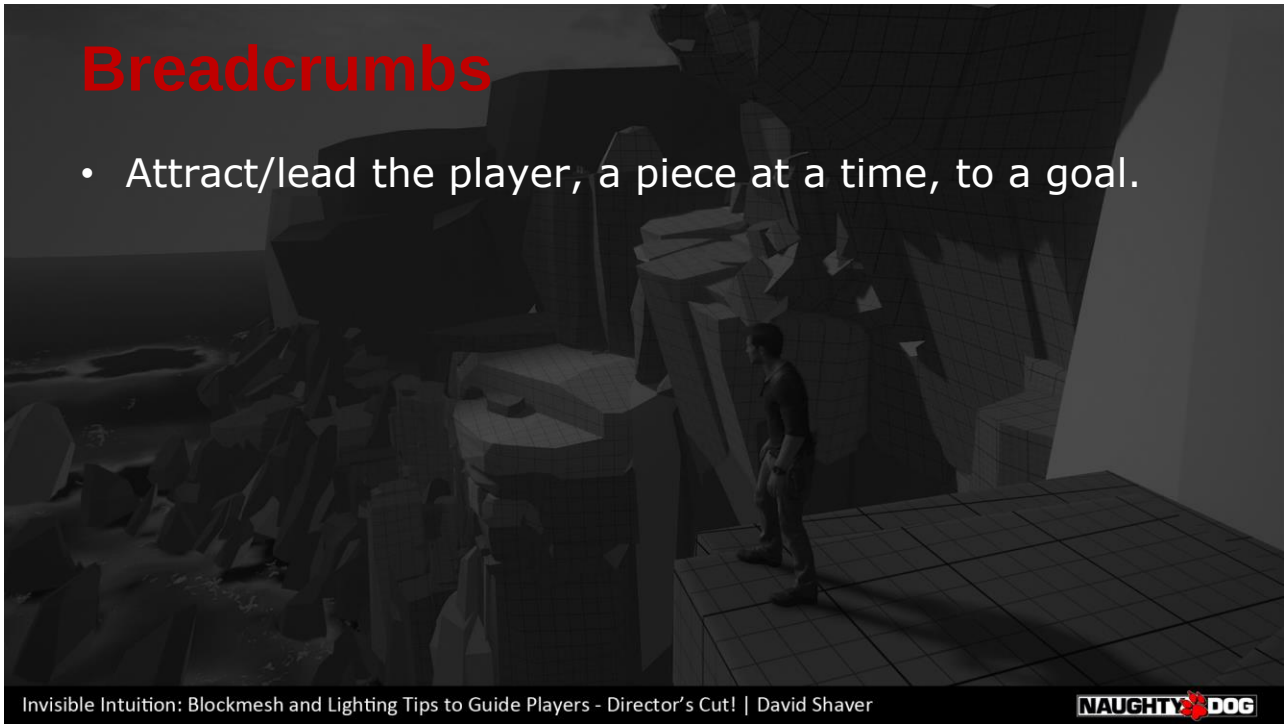
All with just some layout and no forced camera moves.

Blockmesh Guidance Principles

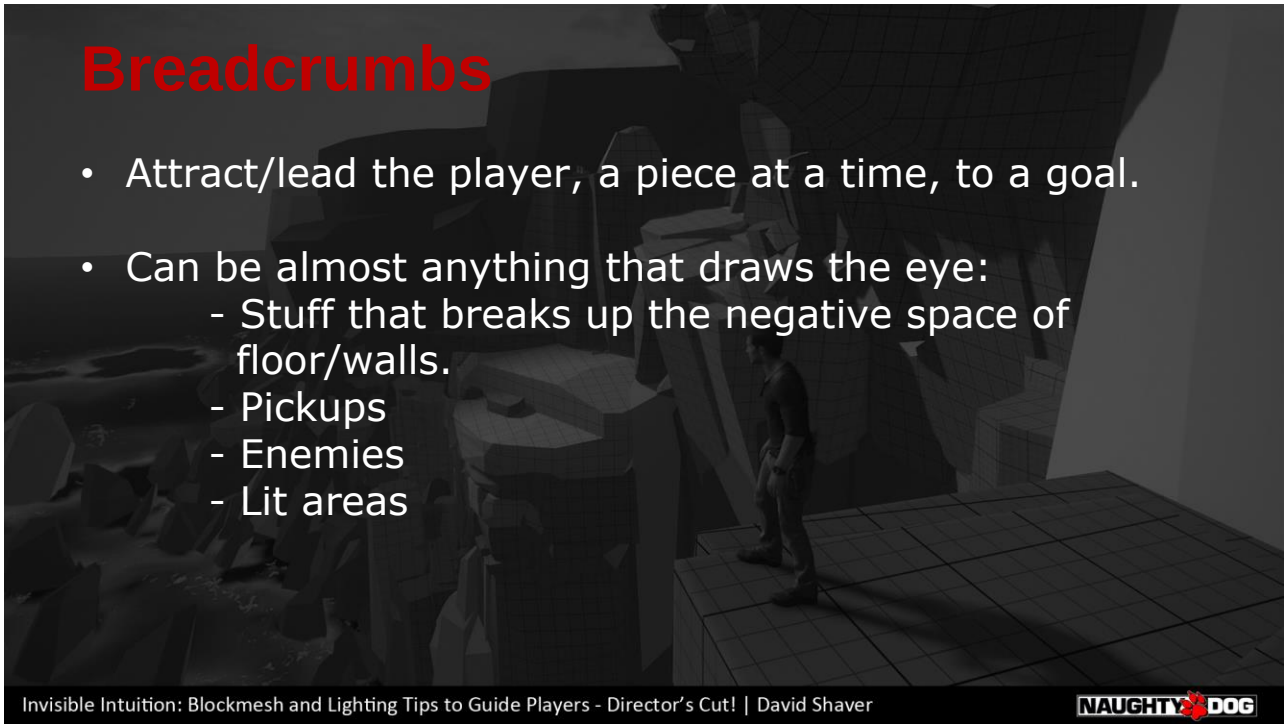
- Affordance
- Denying Affordance
- Visual Language – Shape
- Visual Language – Color
- Landmarks
- Openings Attract
- Gates & Valves
- Leading Lines
- Pinching
- Framing & Composition
- **Breadcrumbs**
- Textures
- Movement
- Light & God Rays

Next tip – Breadcrumbs! Aw yiss.

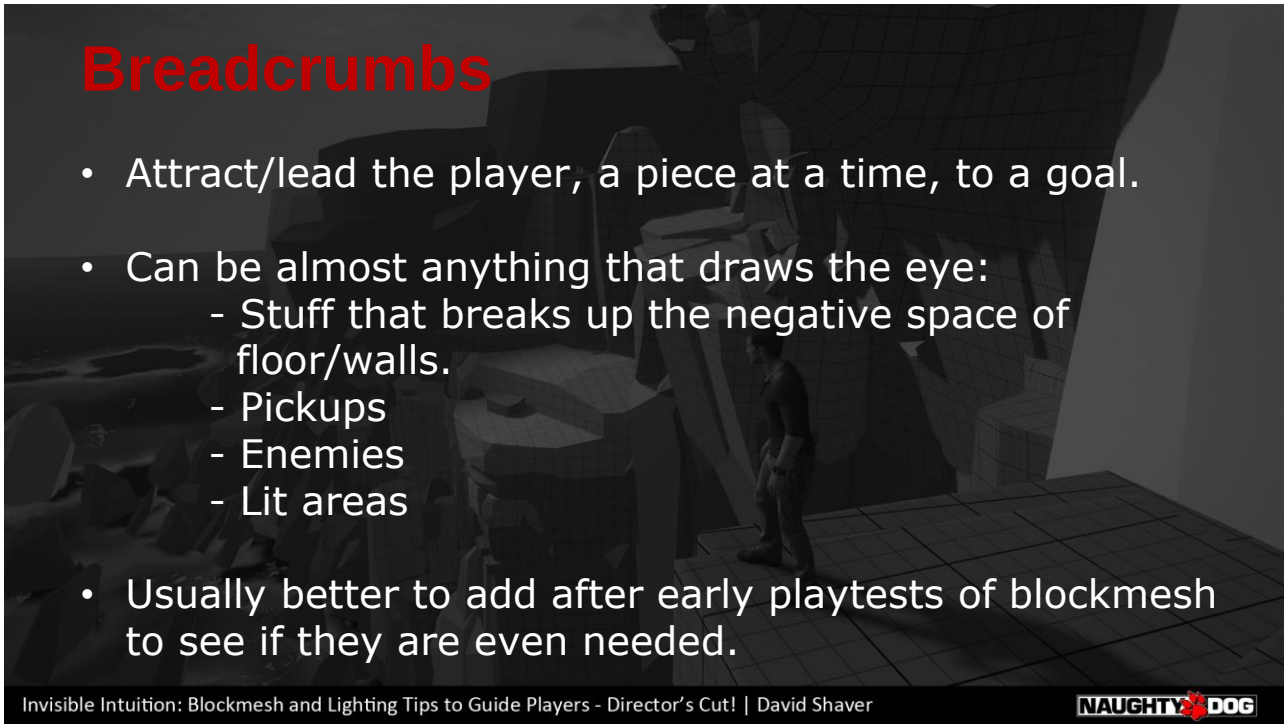
(18:23)



Breadcrumbs lead the player, a little piece at a time, to a goal.



They can be almost anything: chunks of stuff on the ground, pickup items, enemies, lit areas, etc.



It's usually better to add breadcrumbs to your blockmesh after early playtests because they can hide fundamental layout guidance problems.

If they're still needed after a few revisions, then don't feel bad about adding them.

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: Derek Chatwood

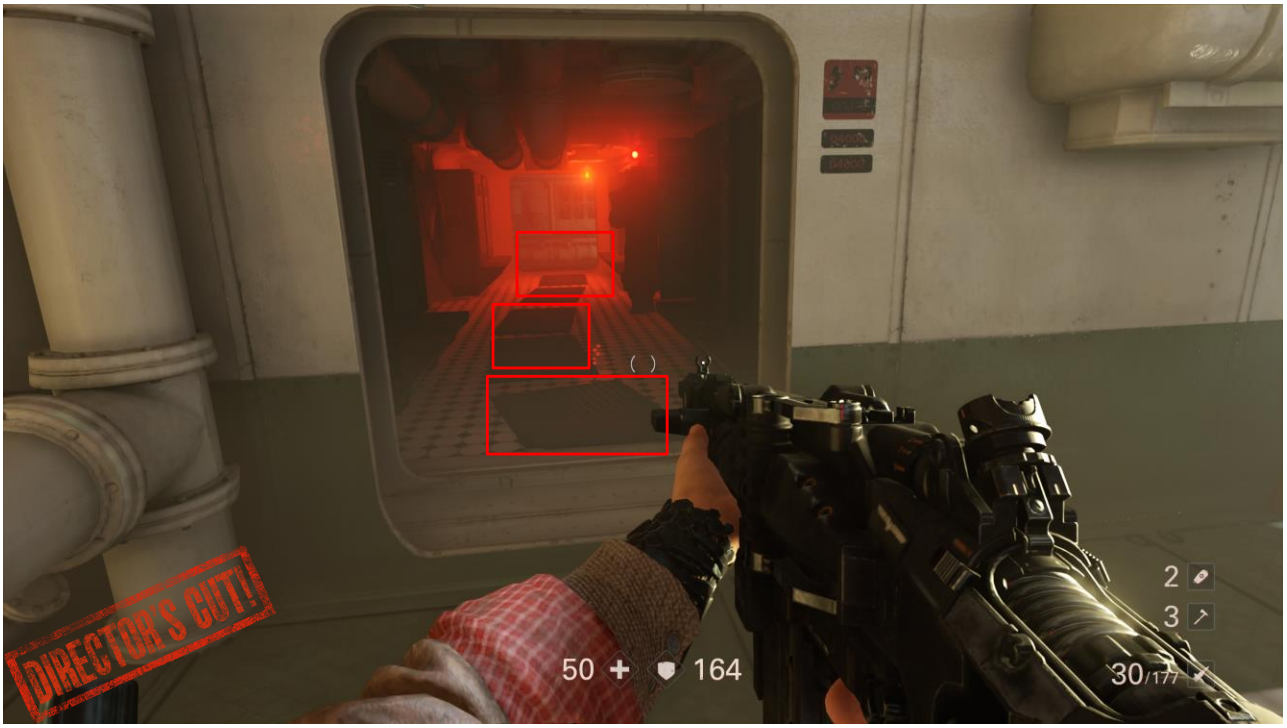
In this example, the bits of fence and roof create visual stepping stones to the ledge.

You may think these are just random or detailed environment art work, but they’re not.

After I took this screenshot and did a dry run of my talk at Naughty Dog, Derek (the designer) told me that they actually added these because players weren’t finding and jumping

to the ledge.

In this example, the floor pads act as guiding lines to draw you down the hallway.



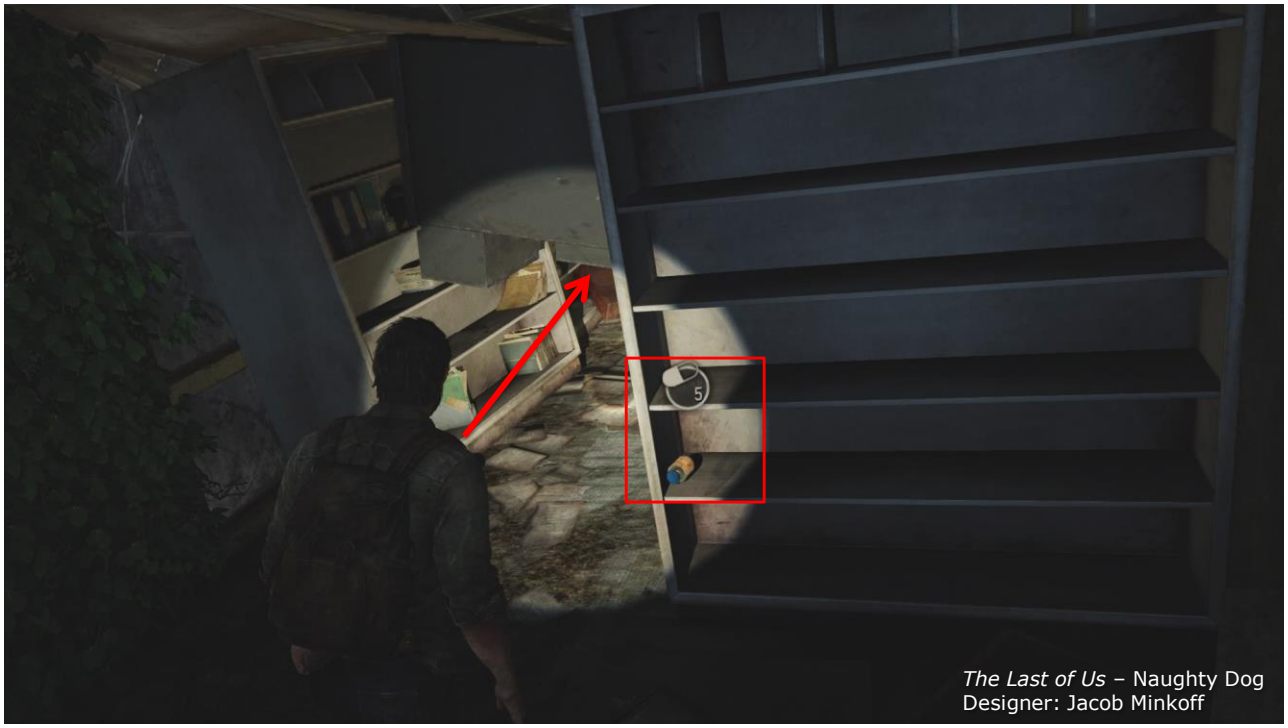
Like so.

Destiny 2 – Bungie

Here’s the same technique in Destiny 2, only this time they are placed outside to guide you into the tunnel.

If your game has them, pickups are a classic way to breadcrumb players around a level.

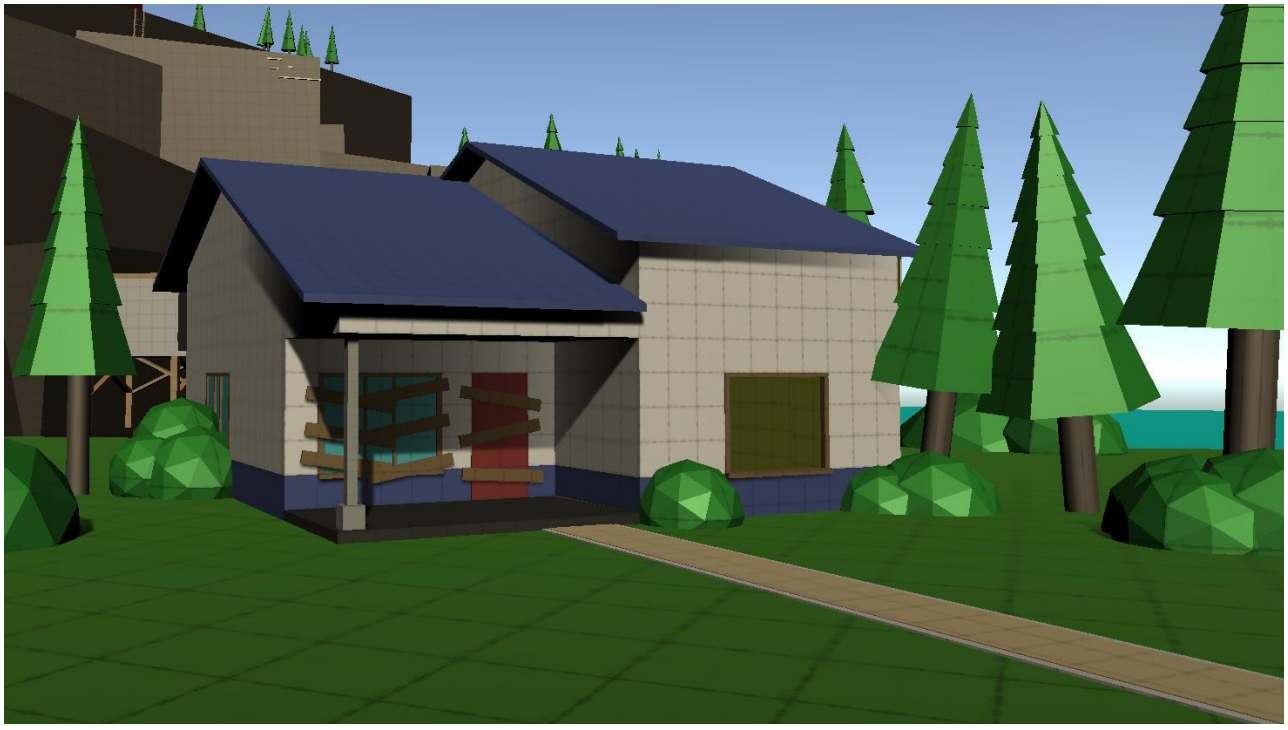
How many times have coins led you to new areas in Mario games?



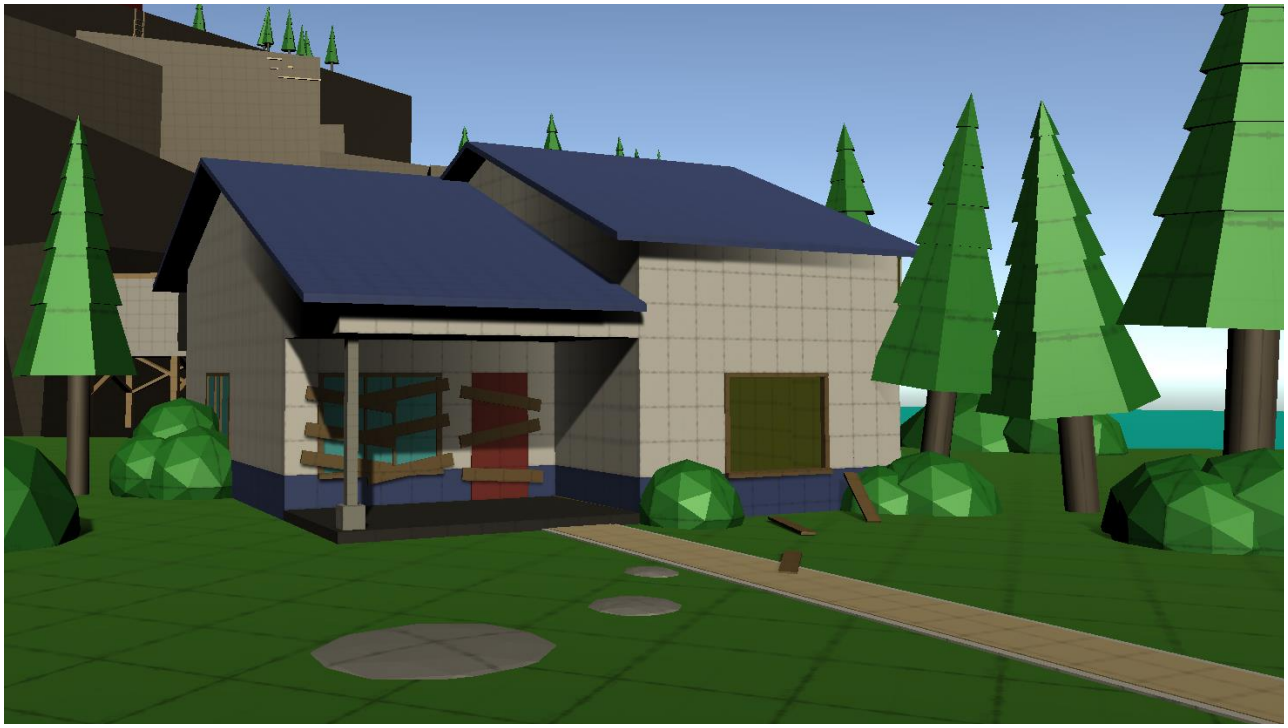
The Last of Us – Naughty Dog
Designer: Jacob Minkoff

Pickups are also great for letting players know they’re on the right path in a cluttered or mazelike environment.

This one is placed next to an area you need to duck under (which some players forget they can do), so it subtly hints “Yep, you’re going the right way.”



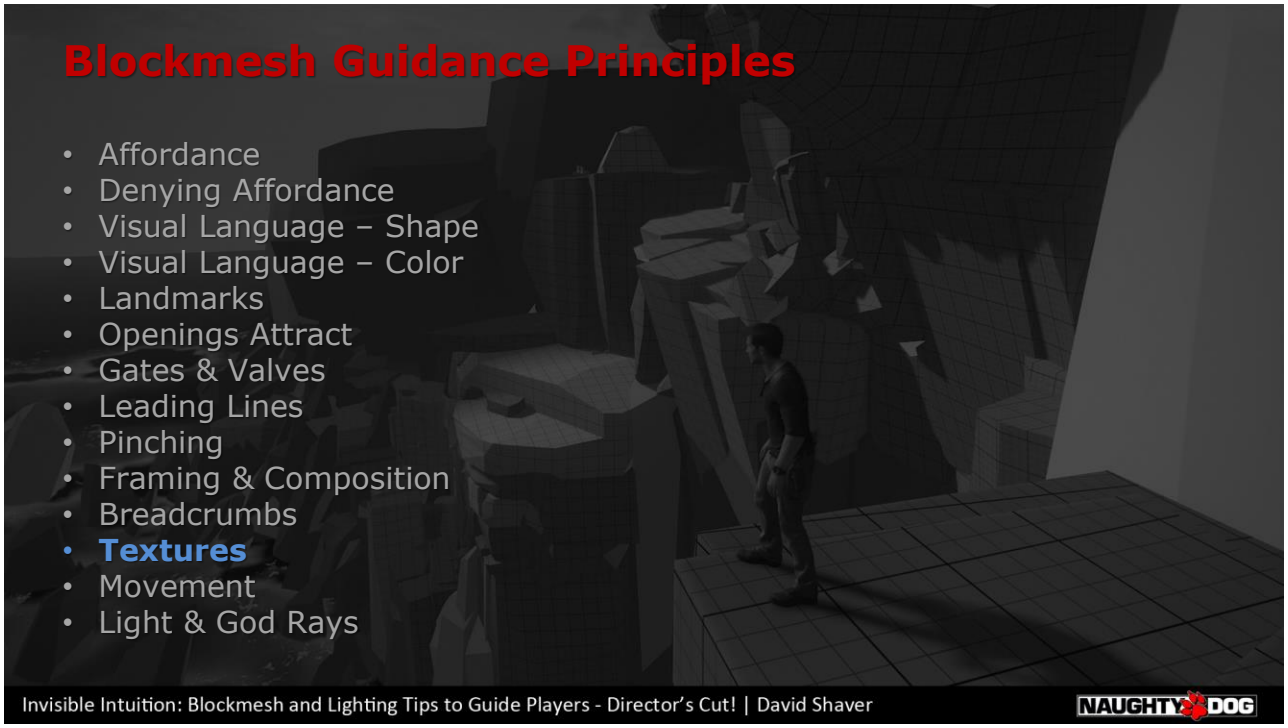
So going back to this house, let’s say only half the players during the last playtest went into the house – and the other half got lost.



Let’s add some rocks and boards as breadcrumbs leading to the window.

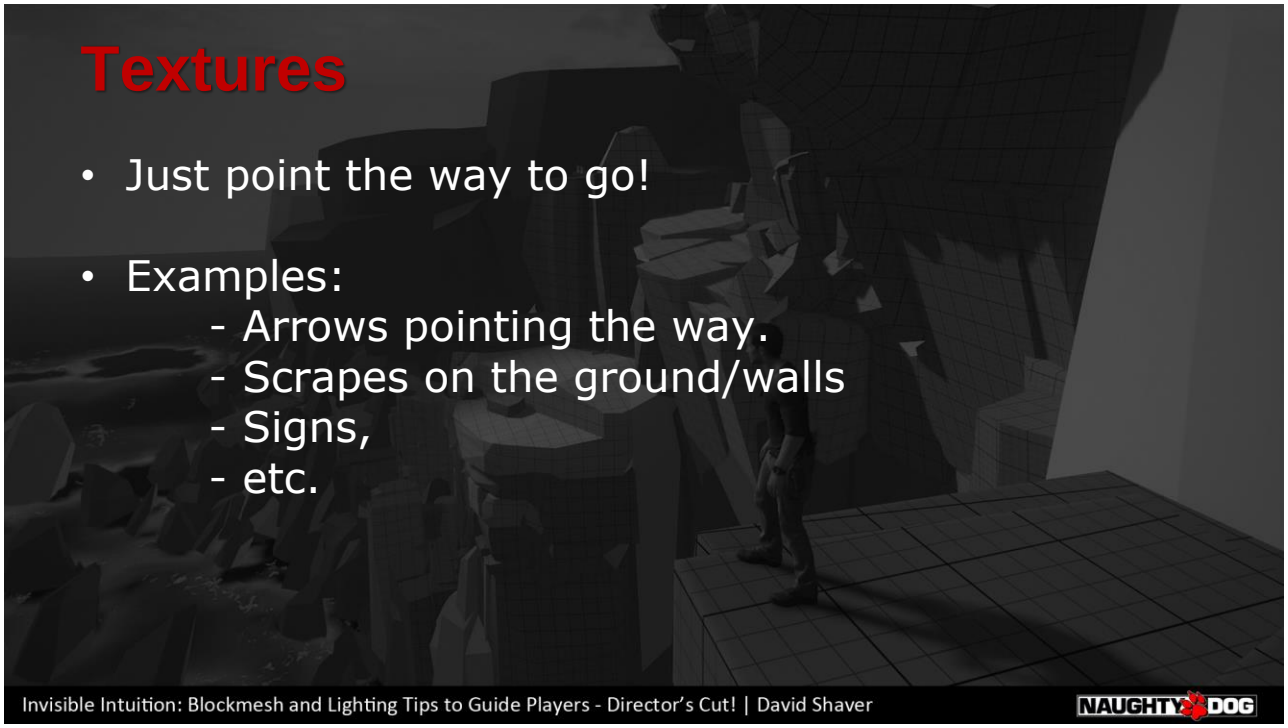
Notice the boards are angled toward the window as well creating leading lines.

You also can still sprinkle breadcrumbs in open world areas to lead players to interesting things - like the panels leading to a tunnel in the Destiny screenshot.



Next tip – textures.

(19:39)



You can use textures to subtly (or obviously) point the way to the goal.

These can be just about anything…arrows, scrapes along the wall, signs, etc.

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: Derek Chatwood

Here in Uncharted: The Lost Legacy…

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: Derek Chatwood

Scrape textures on the wall communicate affordance that you can shimmy here.

This example leads to a secret area and a collectable, so you don’t always need to use these tips just for the main path.

UNCHARTED 4: A Thief's End – Naughty Dog
Designer: James Cooper

Here in Uncharted 4…

…tire tracks on this rock communicate affordance that you can drive here.

When I played this game, I didn't notice the tracks at first and got lost. Once I noticed the tracks, the rest of the driving went smoothly.

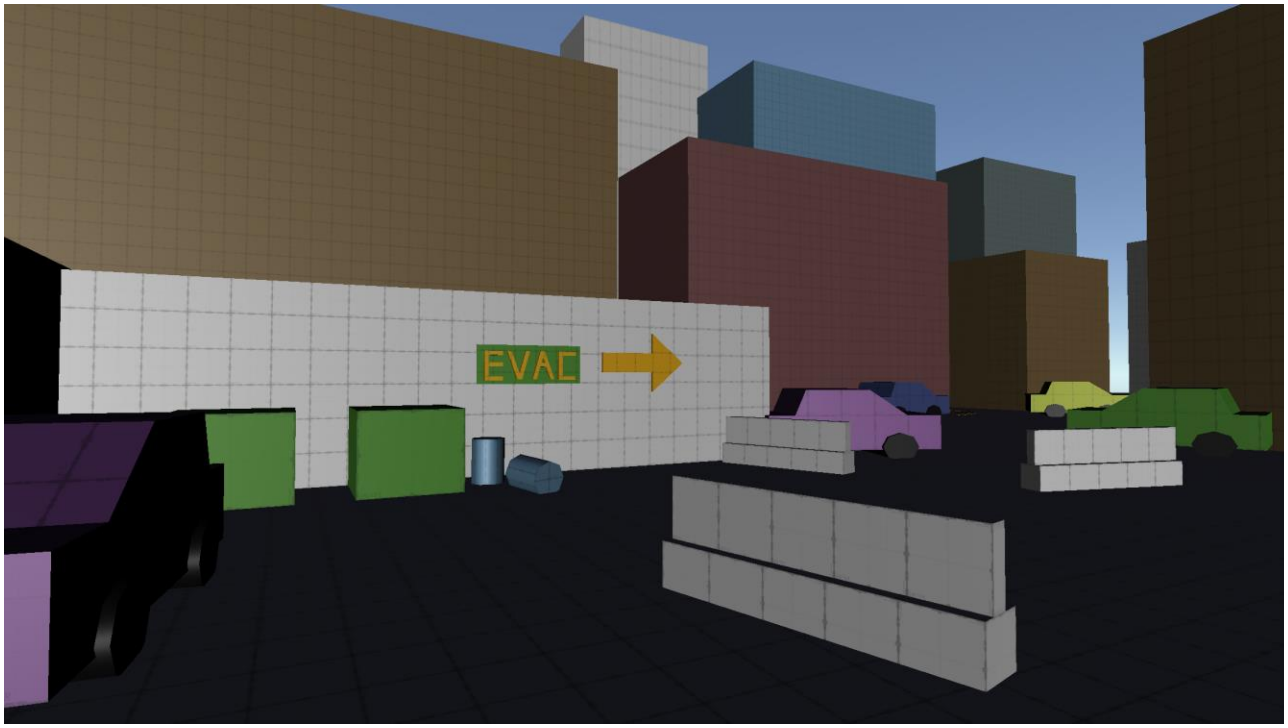
The Last of Us – Naughty Dog
Designer: Peter Field

Signs literally point the way to the hospital, which is also your goal.

More hospital signs as you enter the tunnels.

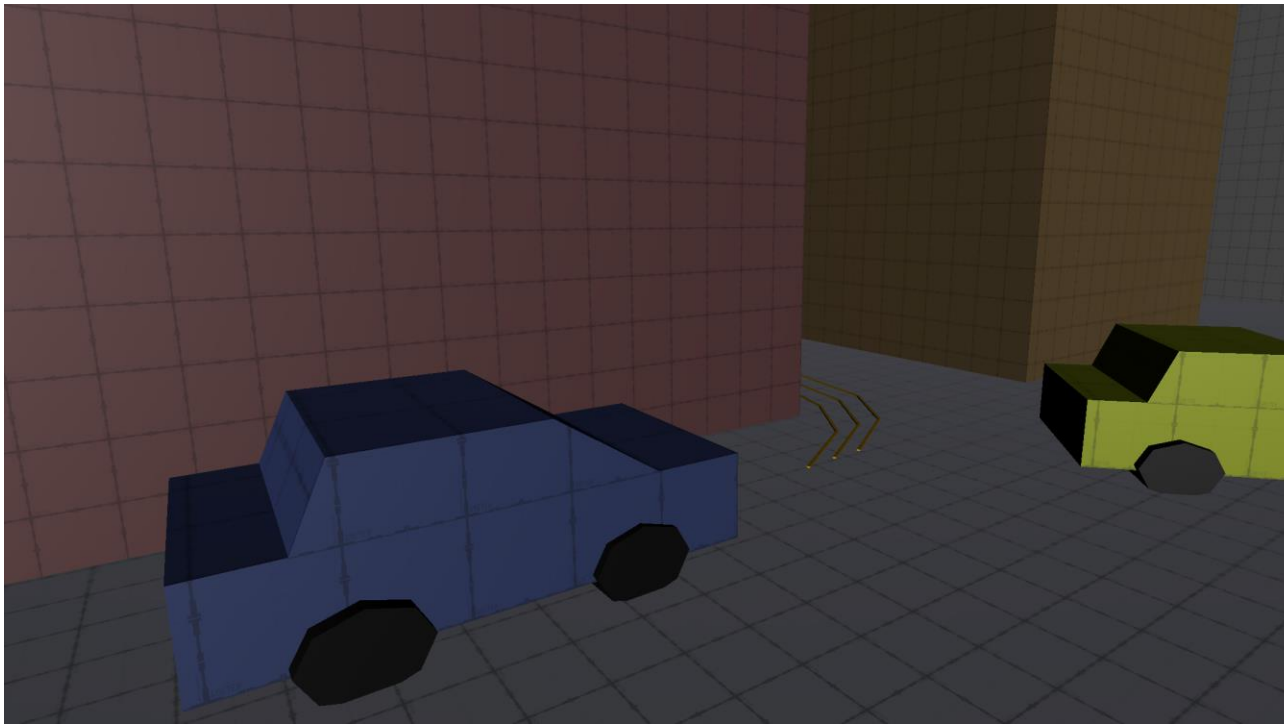
These textures are often some of the last things added when making a level which doesn't really help the early blockmesh phase.

But, guess what? You don't need to wait for an artist to add these!



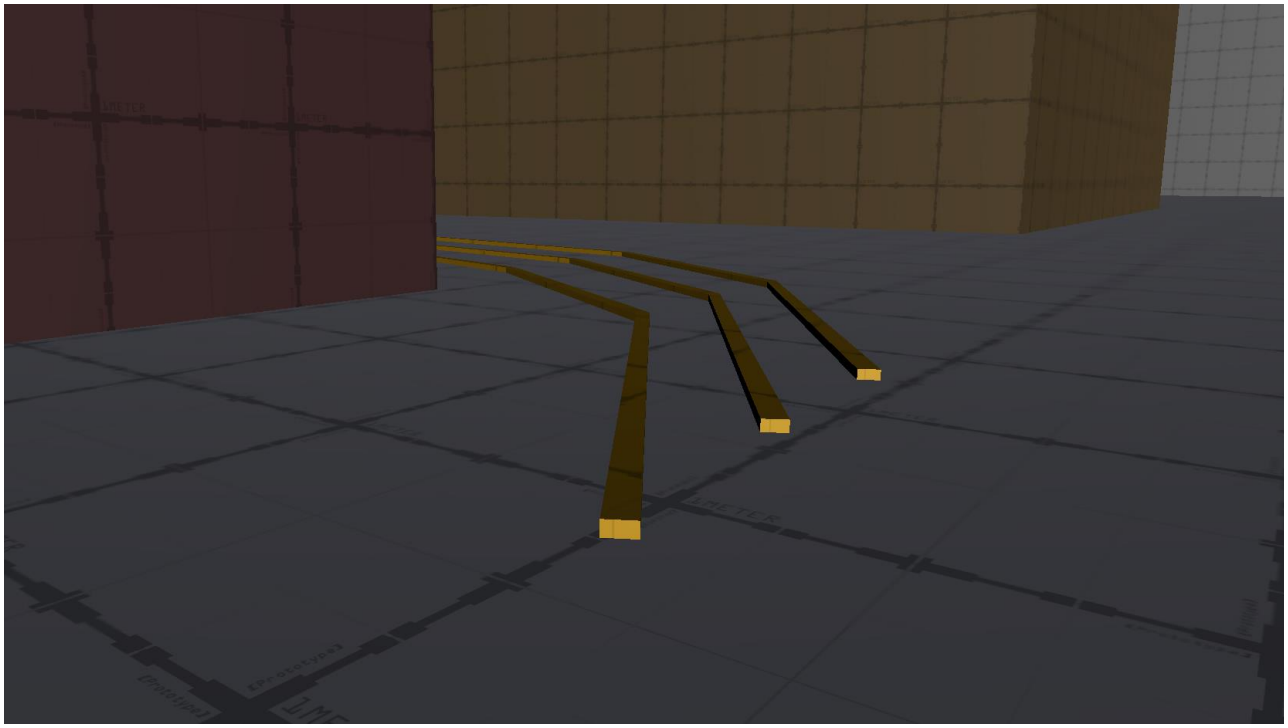
You can build them out of blockmesh for your playtests!

Here I’ve added an arrow and a sign to point the way.

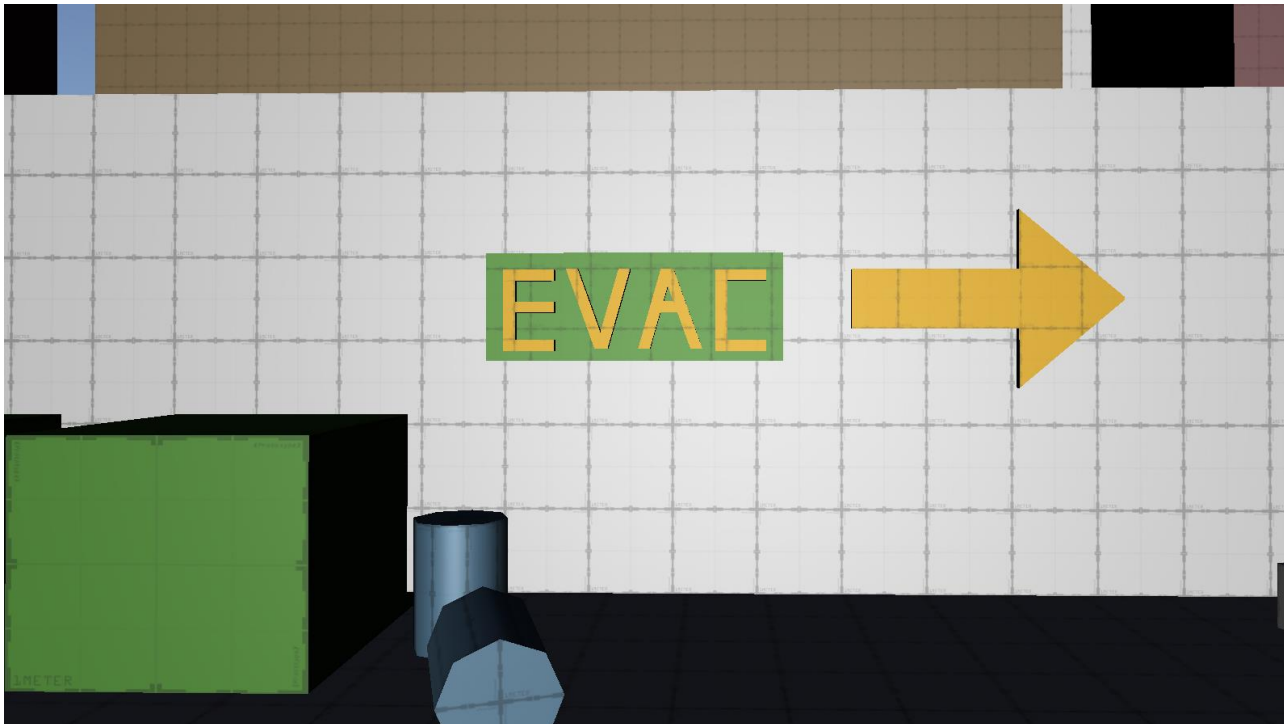


And these scratch marks lead into the alley indicating something heavy was dragged back there.

And the best part?

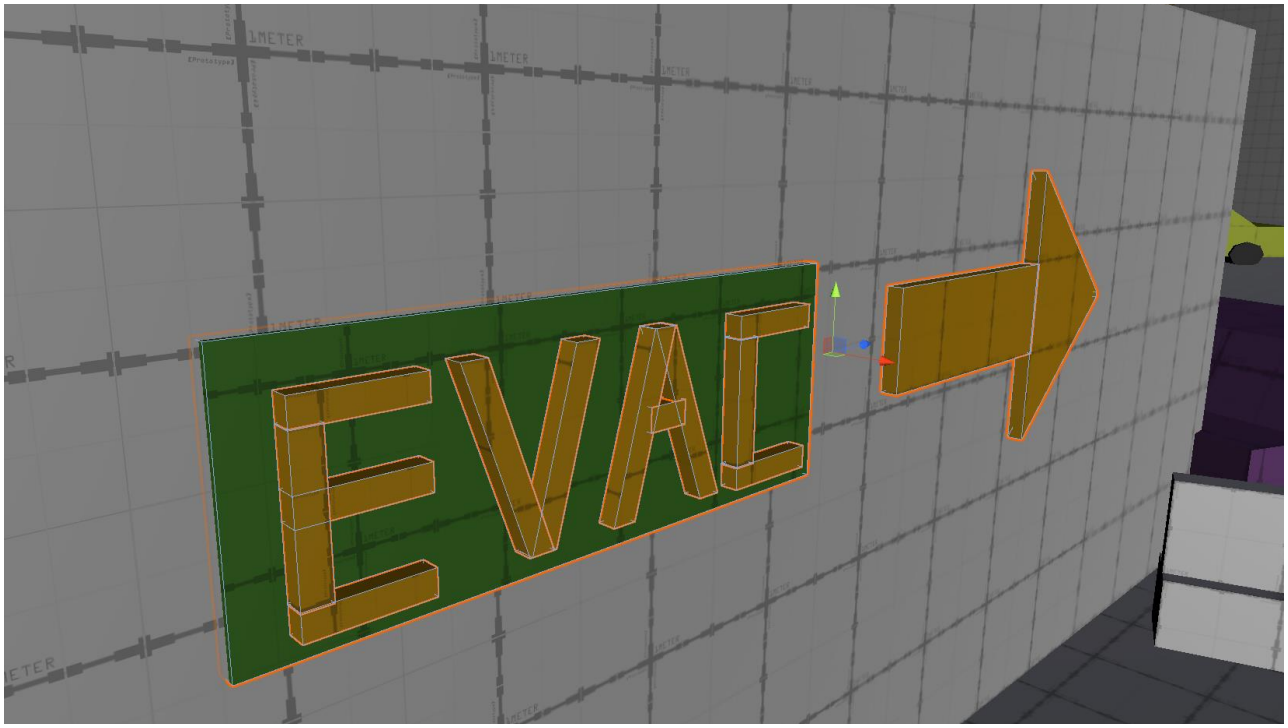


These are just blockmesh too!



Labeling rooms and areas can be super helpful for both linear and open games.

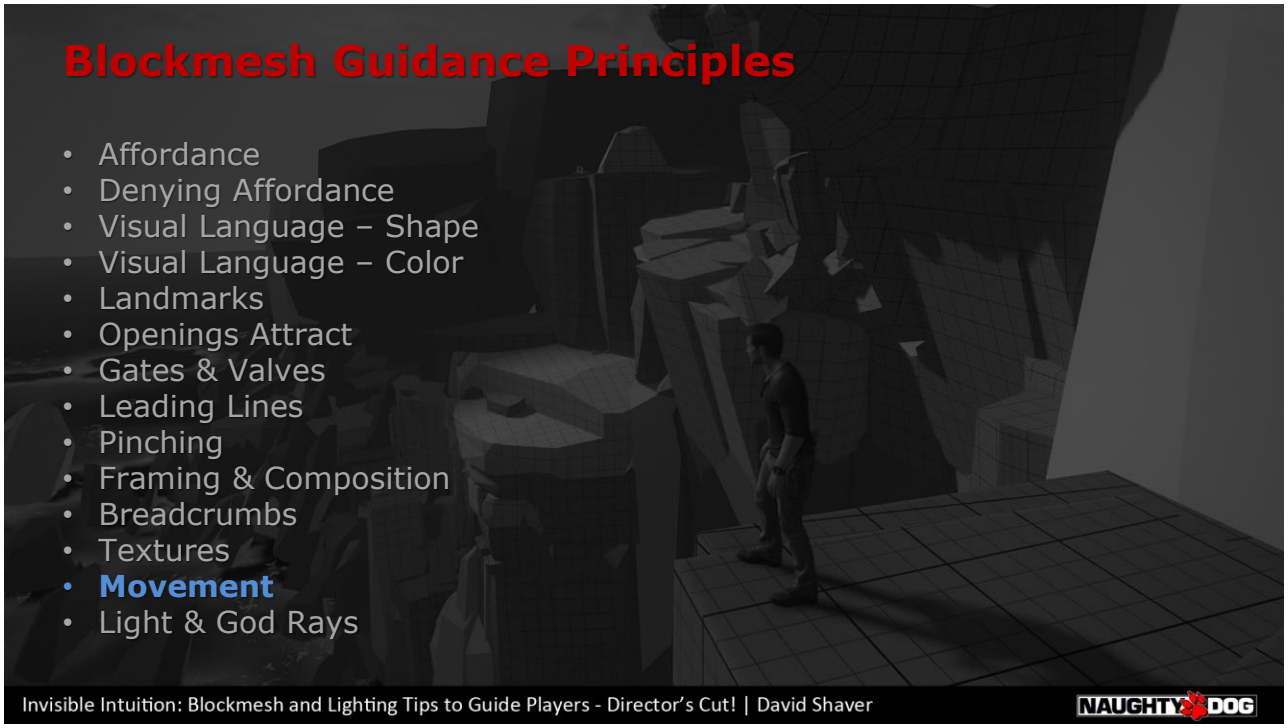
If you’re building a school, for example, having labels like GYM and CAFETERIA provides valuable context and signposts as your playtesters explore.



Here, I’ve pulled this away from the wall a bit to show that it’s just a bunch of blocks.

This stuff only takes a few minutes to do, but works wonders for playtests and to communicate with your artists where you think signage might go.

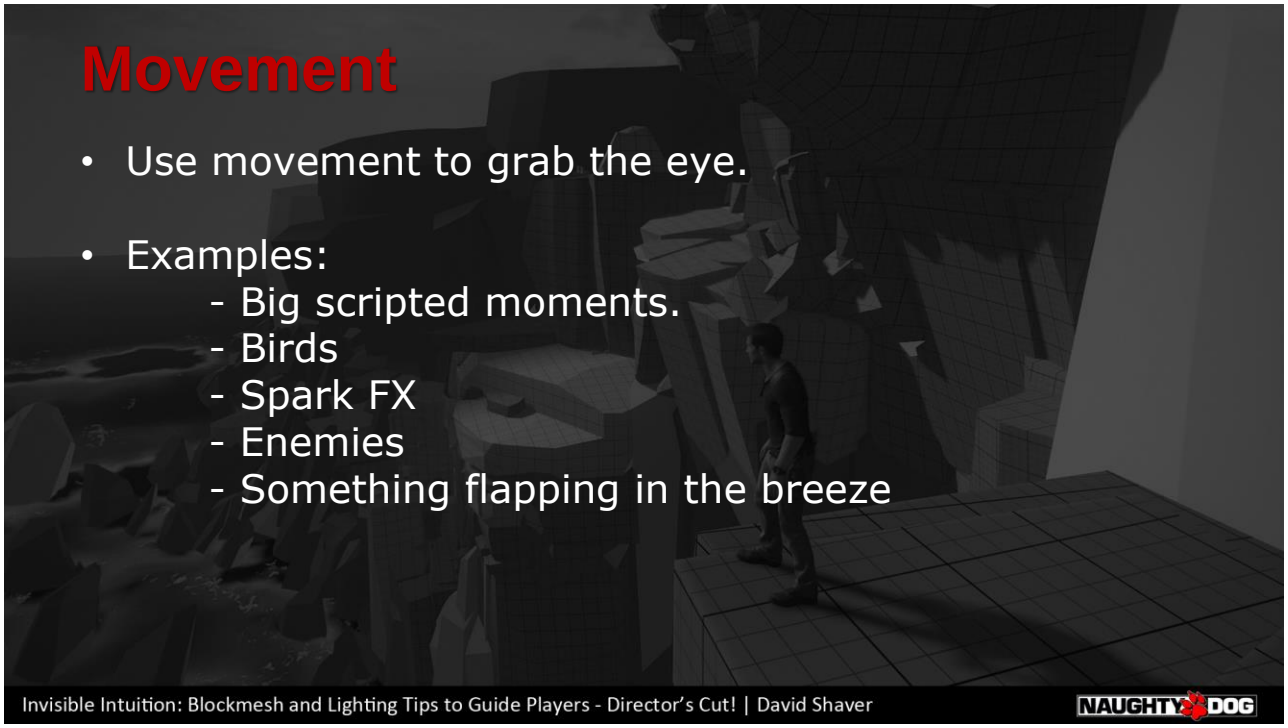
I’m not gonna lie – this one is so simple and obvious and it kinda blew my mind when I learned it.



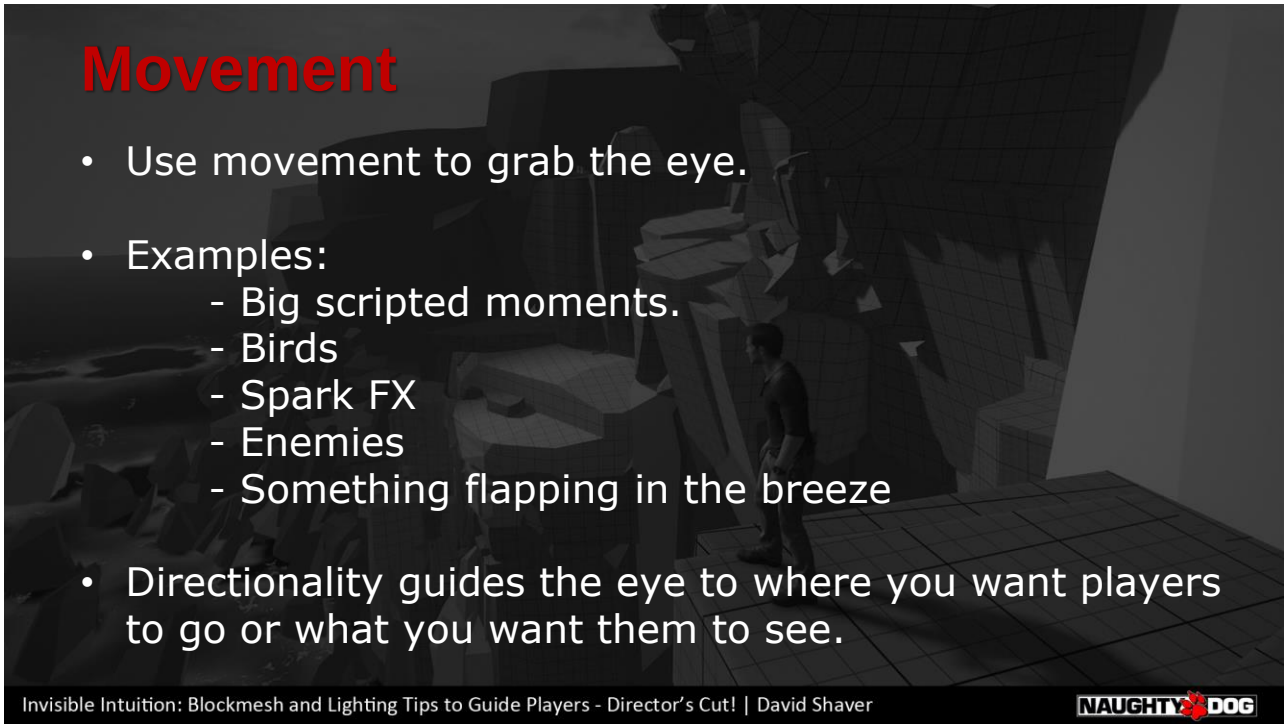
Next tip – movement.

(21:18)

Movement grabs the eye and the player's attention.



This can be anything that fits your game…big scripted moments, birds, sparks, buddies, enemies, and even just something flapping in the breeze.



Also, make good use of the direction of the movement.

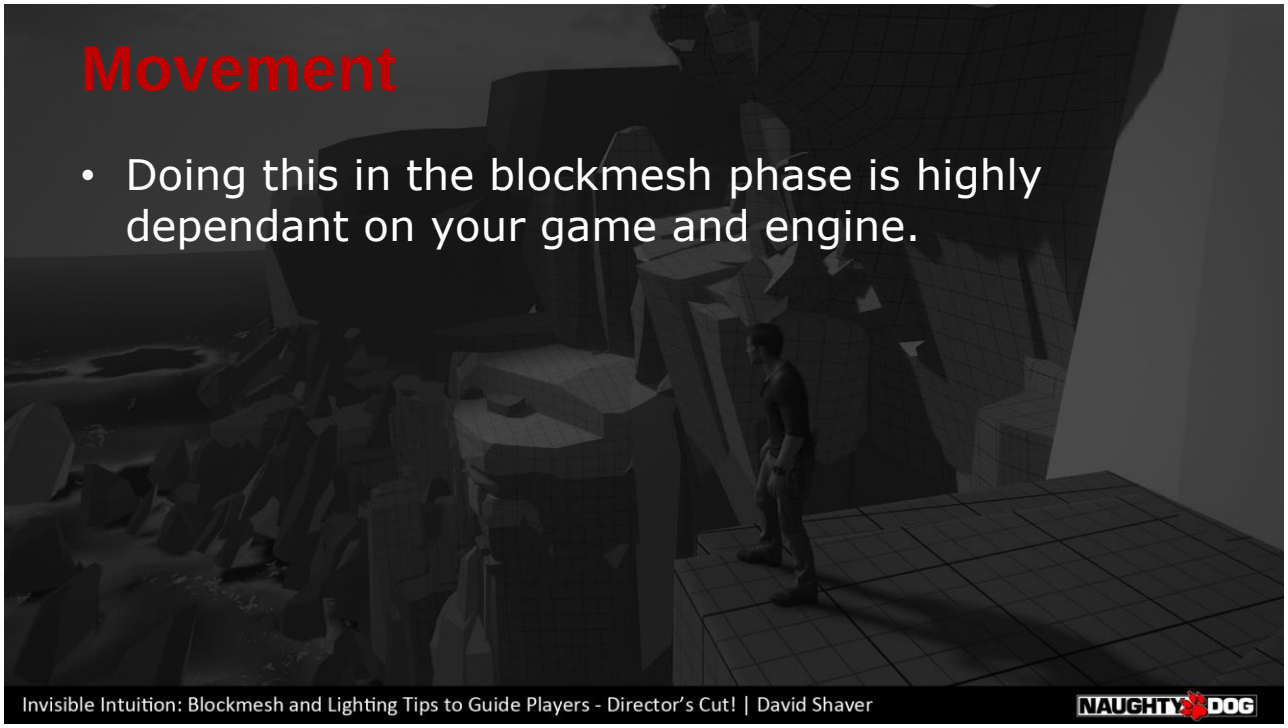
The player's eye will follow the movement, and it can draw an invisible line right to the goal.

In the example I’m about to show, the birds draw your attention to the left where there’s an open trailer door.

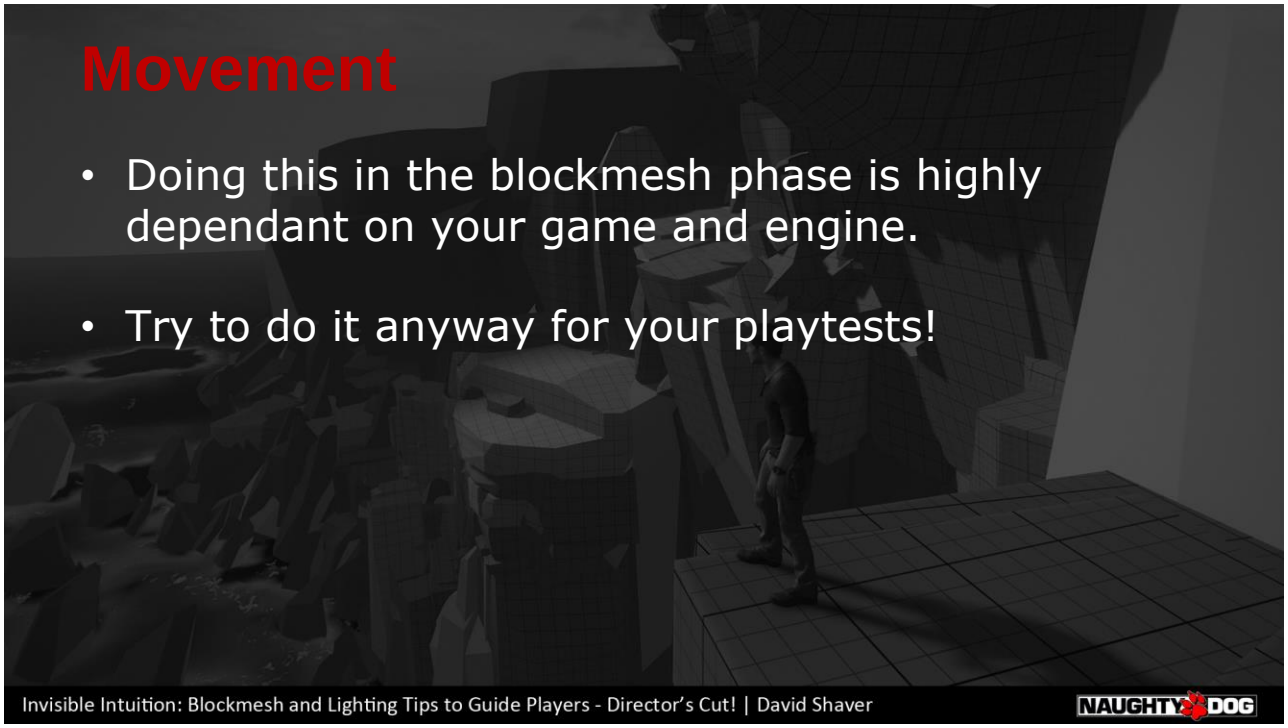
The door is also banging in the wind.

Both of these let you know “Hey, check out what’s inside.”

VIDEO: Birds flying and banging door.

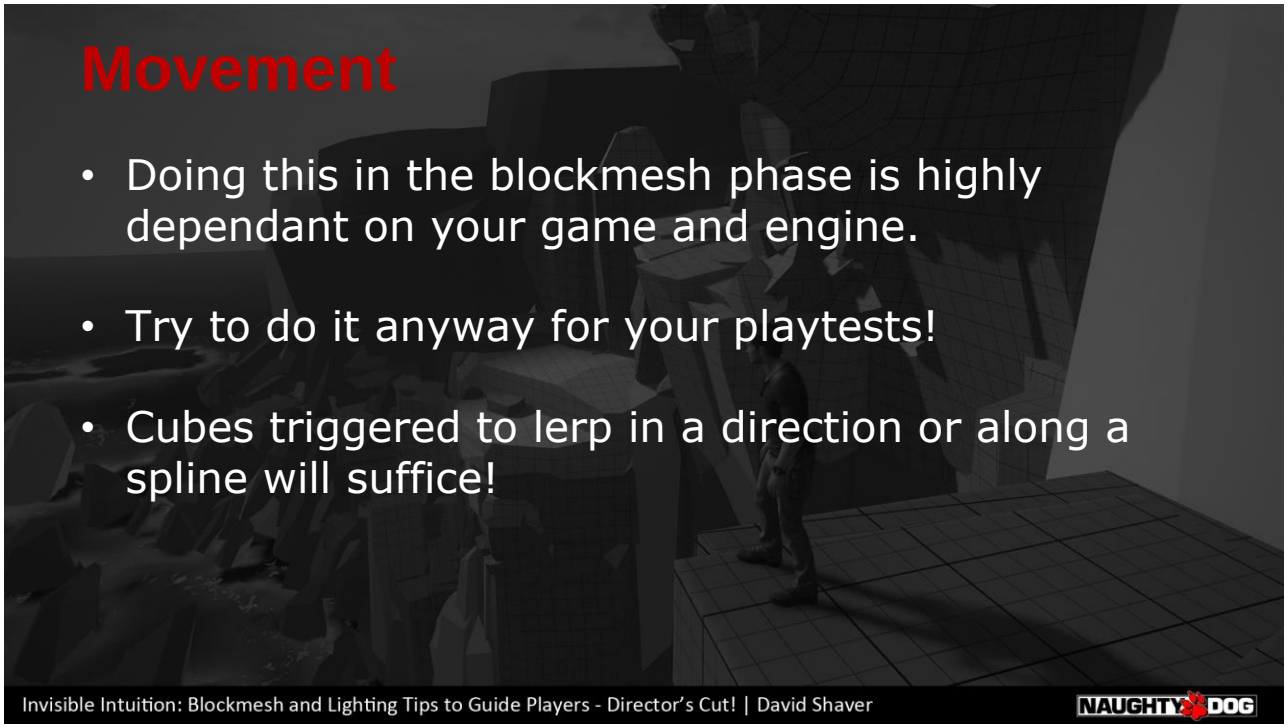


Of course, adding movement in the blockmesh phase is highly dependent on your game and engine.



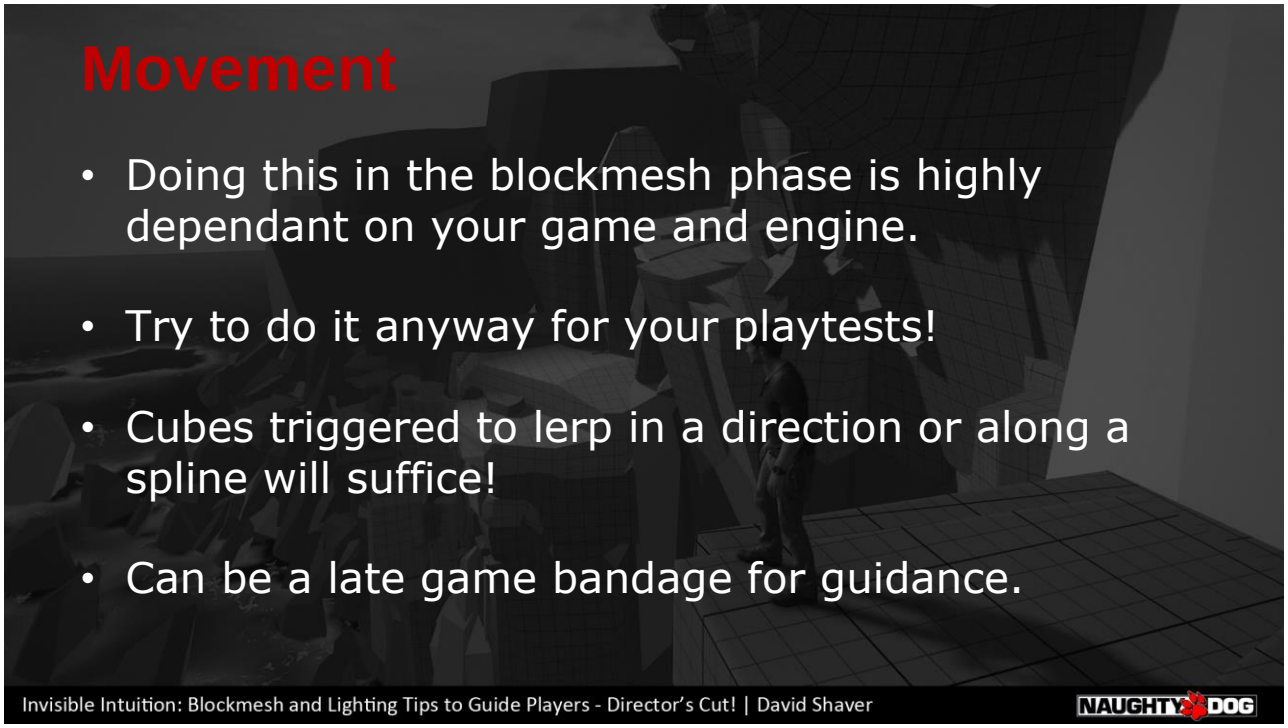
If you can, try to include it for your playtests.

Maybe not the first ones, but definitely before you lock it down.



You don't have to get fancy.

You can have basic cubes lerping through the sky as a placeholder for birds.



Adding movement is also super useful as a bandage late in the development process when the level is basically done, but players are still getting lost.

Since the level itself is done, you can script in some movement to help.

Don't rely on it though. Try to solve the player guidance problems in the blockmesh phase!

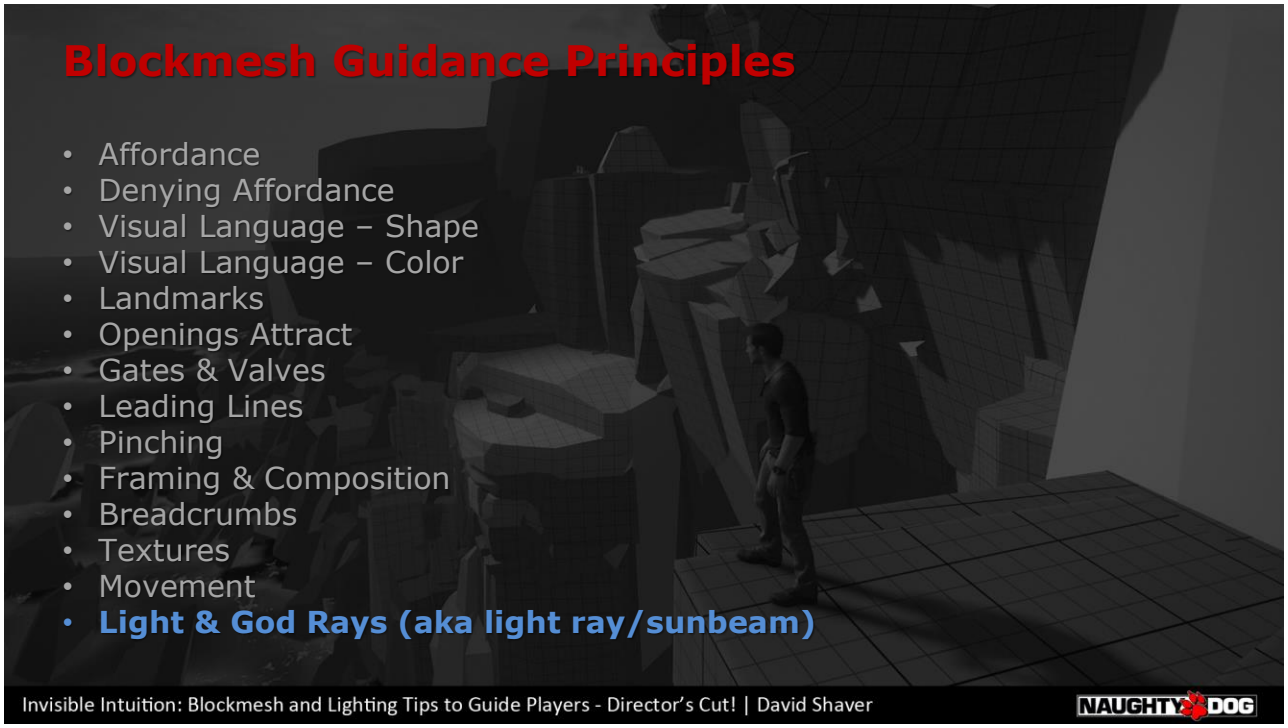
Let’s look at an example from Titanfall 2.

When I scripted this level, I wanted to ensure that players would to go to this tunnel across a large gap with deadly sludge below.

I had one enemy stay at the end of the walkway to bring you to the right spot. Then, I spawned two flying drones from the tunnel that shoot at you and grab your attention.
Now, you are looking right where I want and hopefully, since openings attract and it’s nicely lit, you’ll want to go over there!

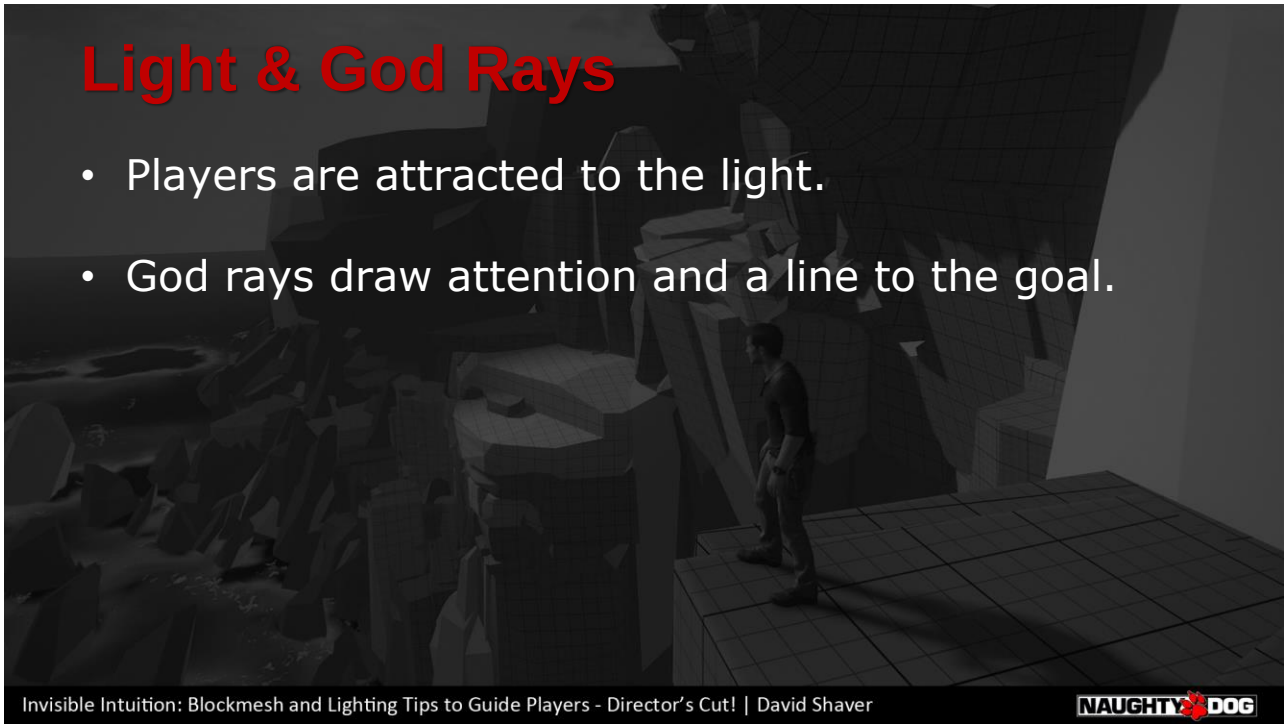
After you kill the drones of course.

VIDEO.



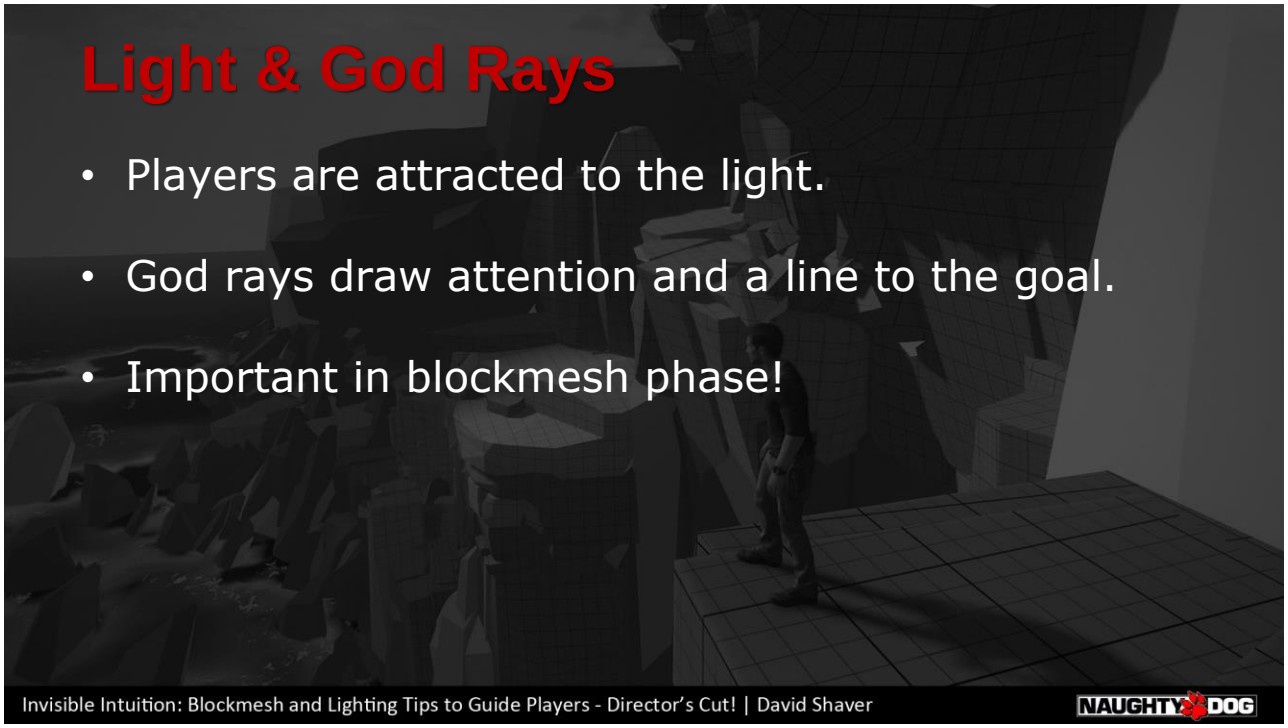
Last tip – Light and god rays, aka light rays or sunbeams.

(22:39)



Light and god rays are useful to guide players to the goal.

People are naturally drawn toward light sources, and god rays point a line at the goal.



This is important even in the blockmesh phase!

The Naughty Dog lighting artists begin lighting levels early.

UNCHARTED: The Lost Legacy – Naughty Dog
Designer: Derek Chatwood

In this example…

The two lit areas are breadcrumbed goals.

First, the one with the bad guy in the middle, then the one at the top right.

Here’s a nice shot from Titanfall 2 with the wallrunning path well lit and the goal also lit complete with god rays pointing at the exit door.

UNCHARTED 3: Drake's Deception – Naughty Dog
Designer: Jonathan Stein

Here we have some god rays coming out of a window.

They take up more screen space so you're more likely to notice them, and they draw leading lines to the window, which is the exit.

Also, this fish is totally drawing an arrow pointing at the window.

OK…time for some….


DIRECTOR'S CUT!
Bonus Tips!
Invisible Intuition: Blockmesh and Lighting Tips to Guide Players - Director's Cut! | David
NAUGHTY DOG

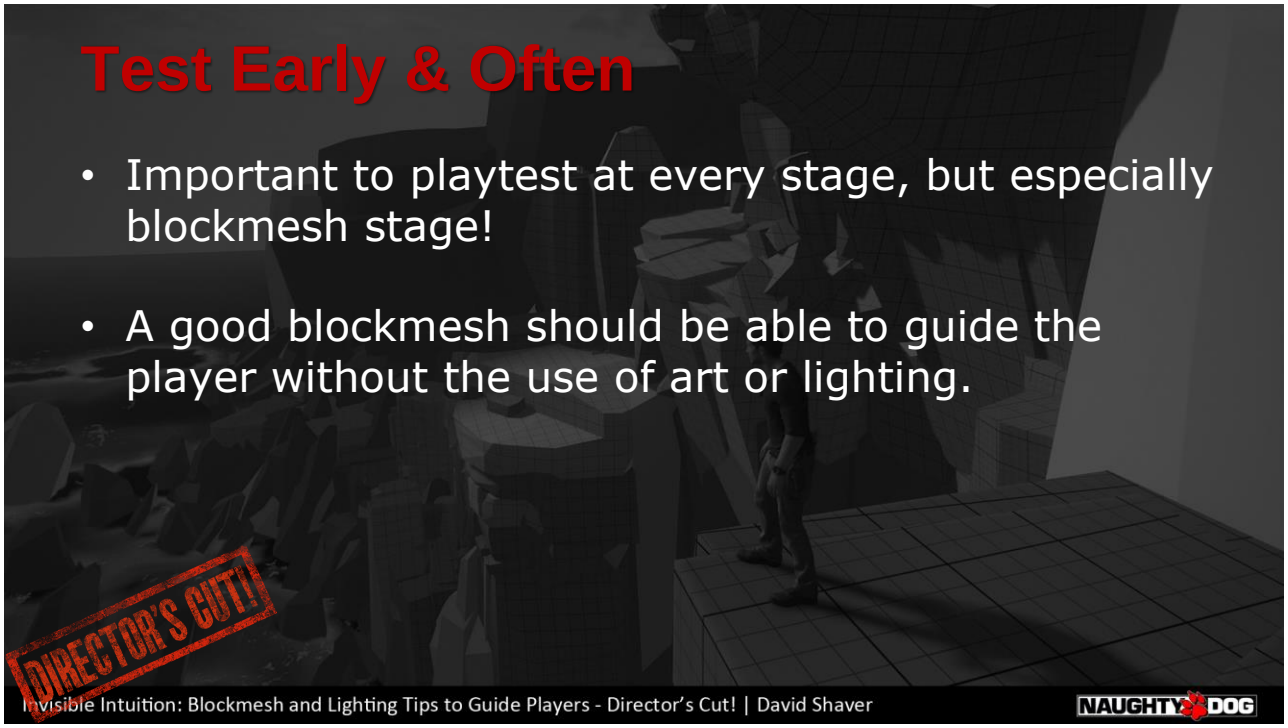
…bonus tips!

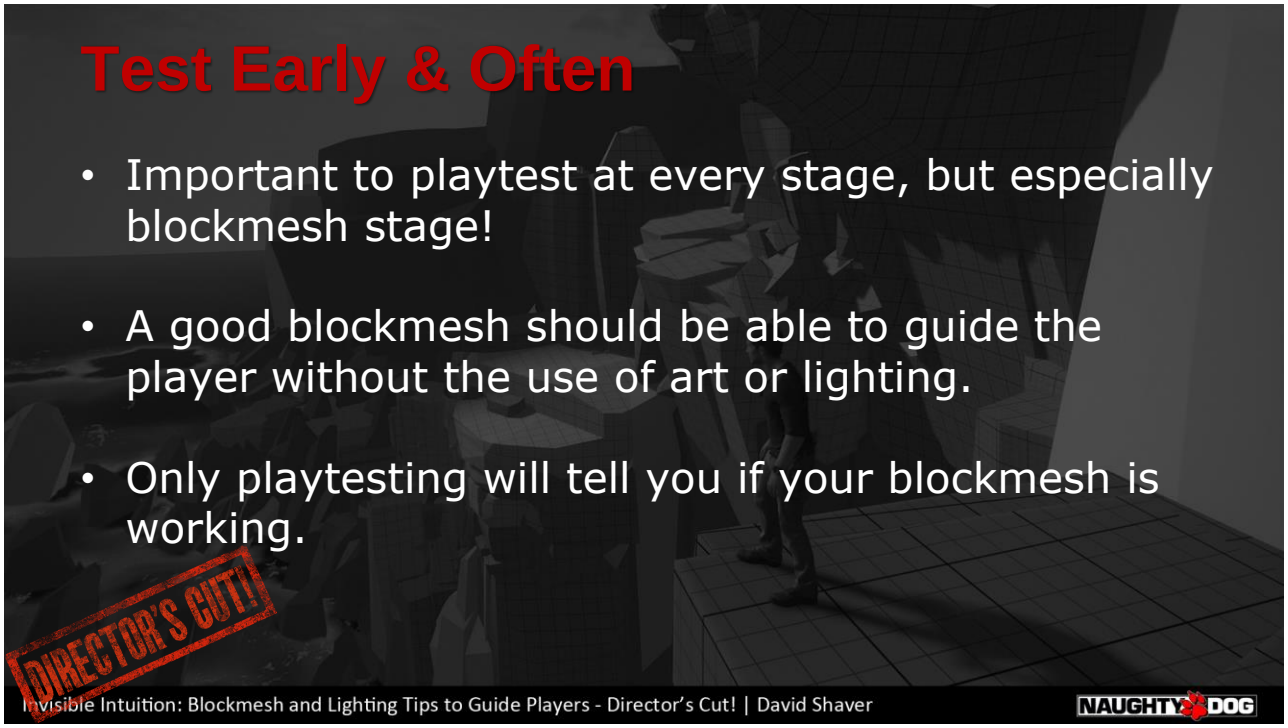
I've mentioned it before, but it's so important, it deserves it's own slide.

Test early and test often!

It doesn't matter how ugly the blockmesh is. Grab someone at work or a friend and watch them play through your level.
Does it guide them to where you want them to go? Do they get lost?

Quietly take note, make changes, grab someone else to play, and see if it fixes the problems.


Test Early & Often
• Important to playtest at every stage, but especially blockmesh stage!
• A good blockmesh should be able to guide the player without the use of art or lighting.
DIRECTOR'S CUT!
Invisible Intuition: Blockmesh and Lighting Tips to Guide Players - Director's Cut! | David Shaver
NAUGHTY DOG



Only by playtesting, will you know if your blockmesh is working.

Of course, this assumes you have gameplay mechanics and metrics in place.

In the early stages of development it's not so easy.

Test Early & Often

Designing Unforgettable 'Titanfall' Single Player Levels with Action Blocks

Christopher Dionne (Senior Game Designer, Respawn Entertainment)

https://www.gdcvault.com/play/1025105/Designing-Unforgettable-Titanfall-Single-Player

DIRECTOR'S CUT!

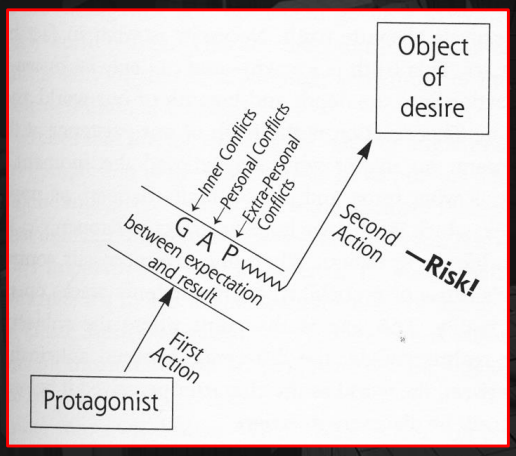
We generated over a 100 of them and picked the best to go in Titanfall 2.

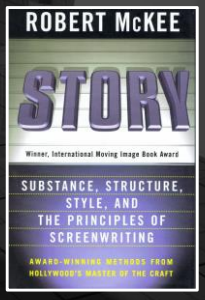
I highly recommend my friend Chris's GDC talk on action blocks as seen here.

It's a really awesome, and if you have GDC Vault access, you should check it out!

Bending the Rules

- If you have established languages and player trust, you can start to play with their expectations.





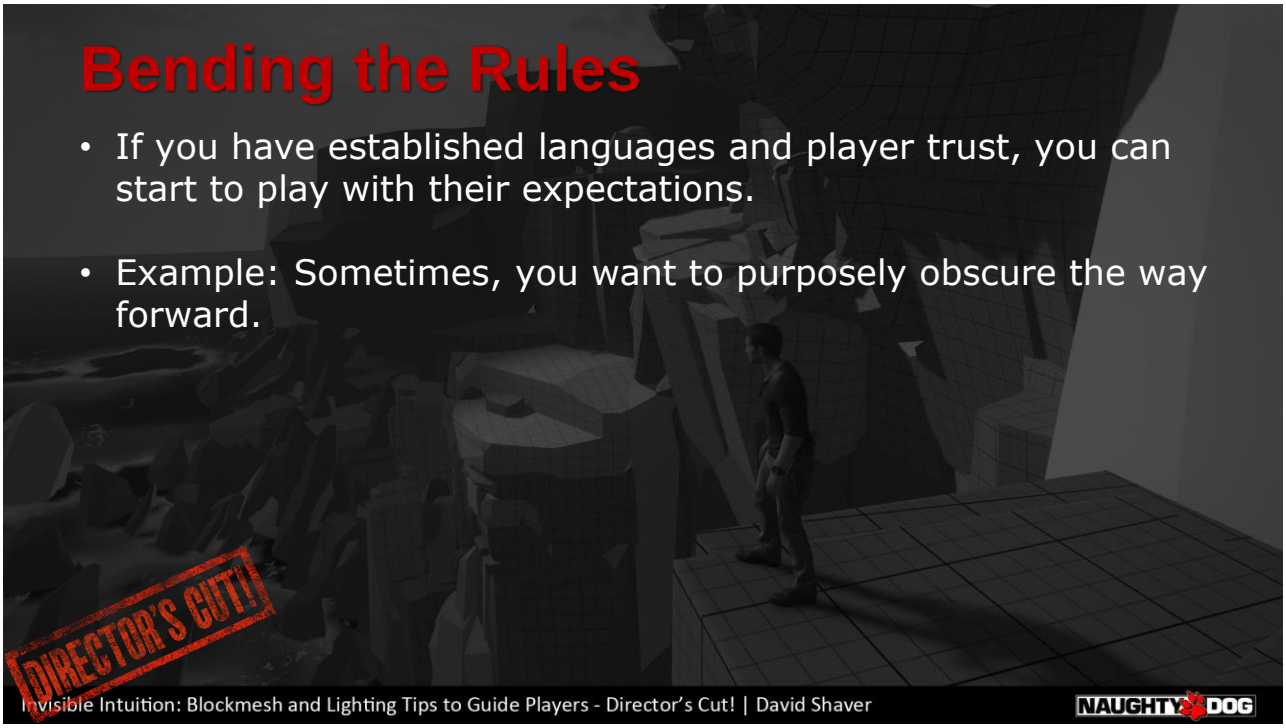
DIRECTOR'S CUT!

in the way and you have to do a second, riskier action to obtain the goal.

Recent examples include games like Undertale and Doki Doki Literature club where they totally mess with your expectations of what you think those kinds of games are going to do.

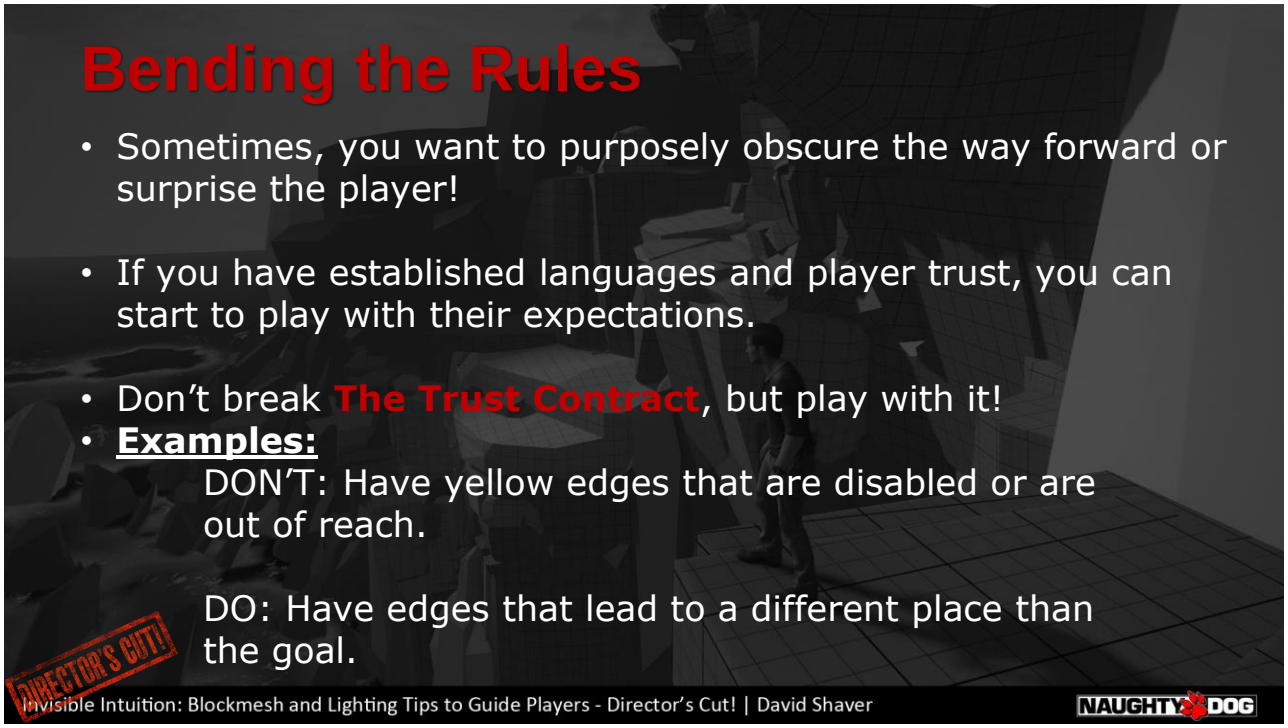
Bending the Rules

- If you have established languages and player trust, you can start to play with their expectations.
- Example: Sometimes, you want to purposely obscure the way forward.



now they reach an area that suddenly isn’t so obvious.

They are expecting to smoothly navigate but the reality is now have to explore. Along the way, they find goodies you placed.



You can bend, but don't break the rules.

Your visual shape and color language shouldn't be messed with for example.

If you have yellow edges as your language indicating climbing, don't just disable them or put them where the player can never reach them.

But you can totally have edges that

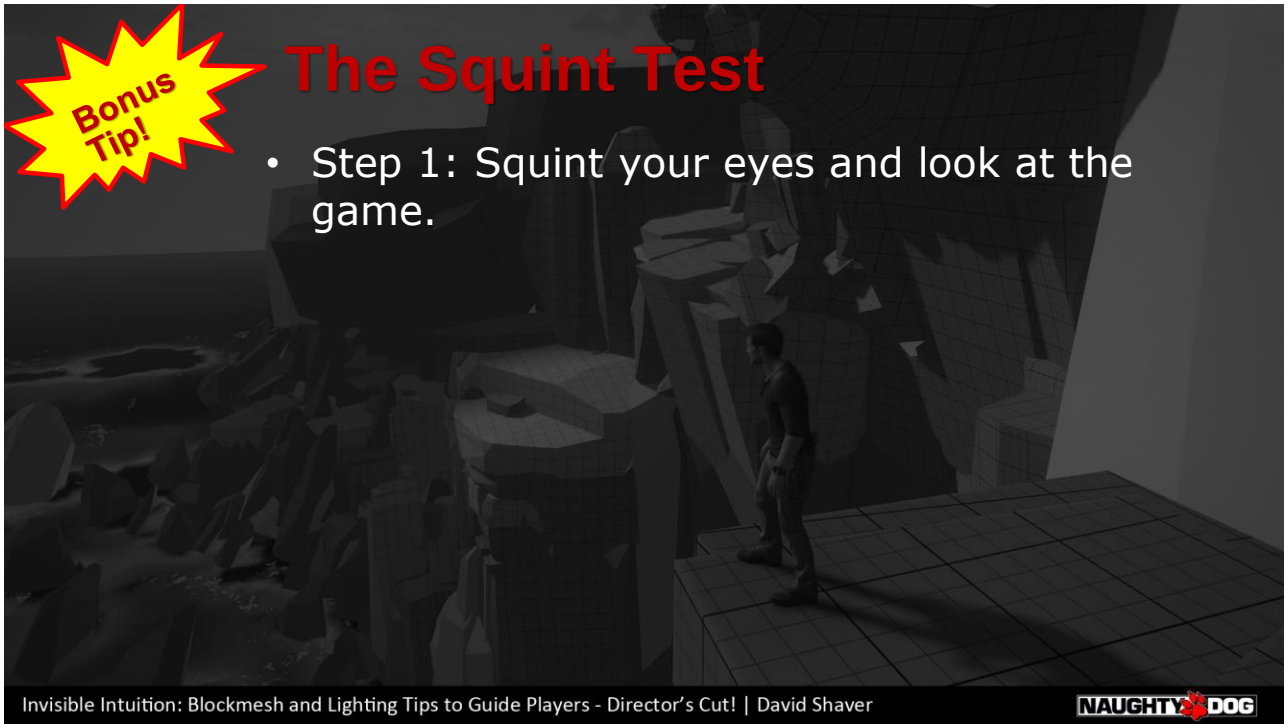
lead to a secret area instead of the main path.

Before we move on and because I feel the gap is so important to re-iterate, I want to show you this clip from Bruce Straley and Neil Druckmann's GDC 2010 talk Creating the Active Cinematic Experience of Uncharted 2: Among Thieves.

Rather than just paraphrasing Bruce's excellent example, let's hear it from the man himself.

(VIDEO)

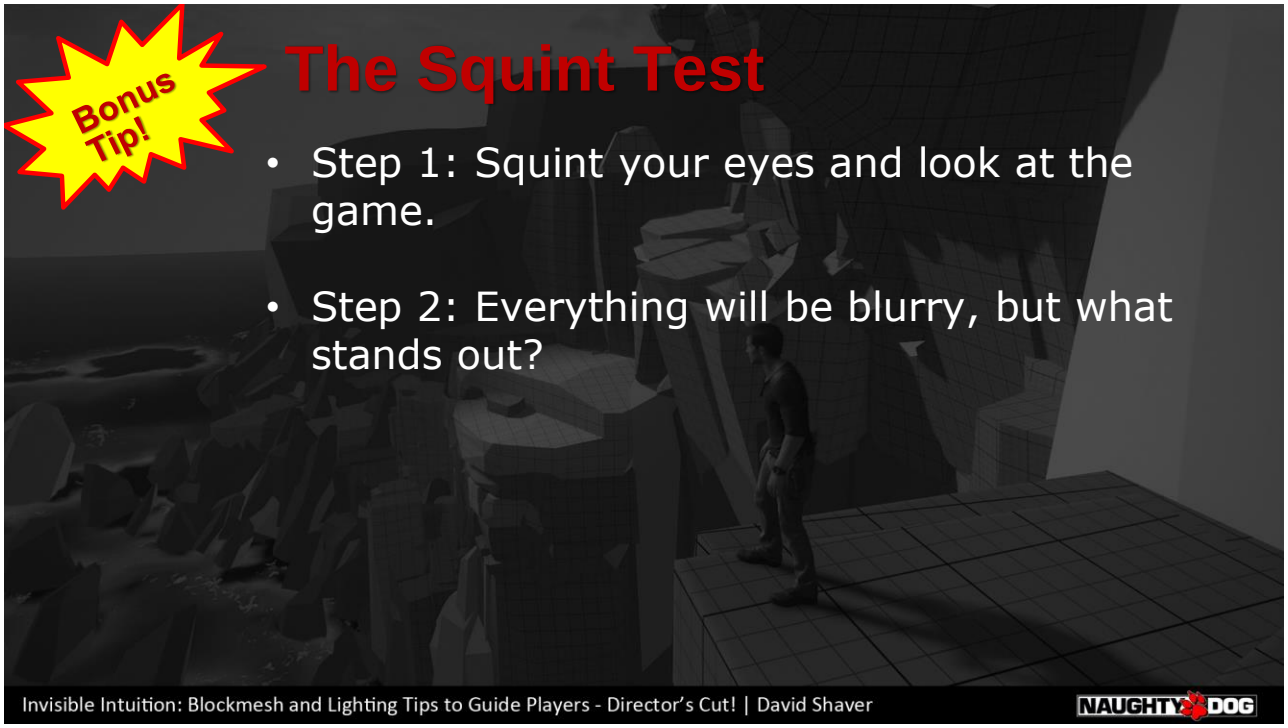
OK, next we have…



…the squint test. So simple. So majestic. But what is it?

Well, it's basically an easy way to see what stands out in your level.

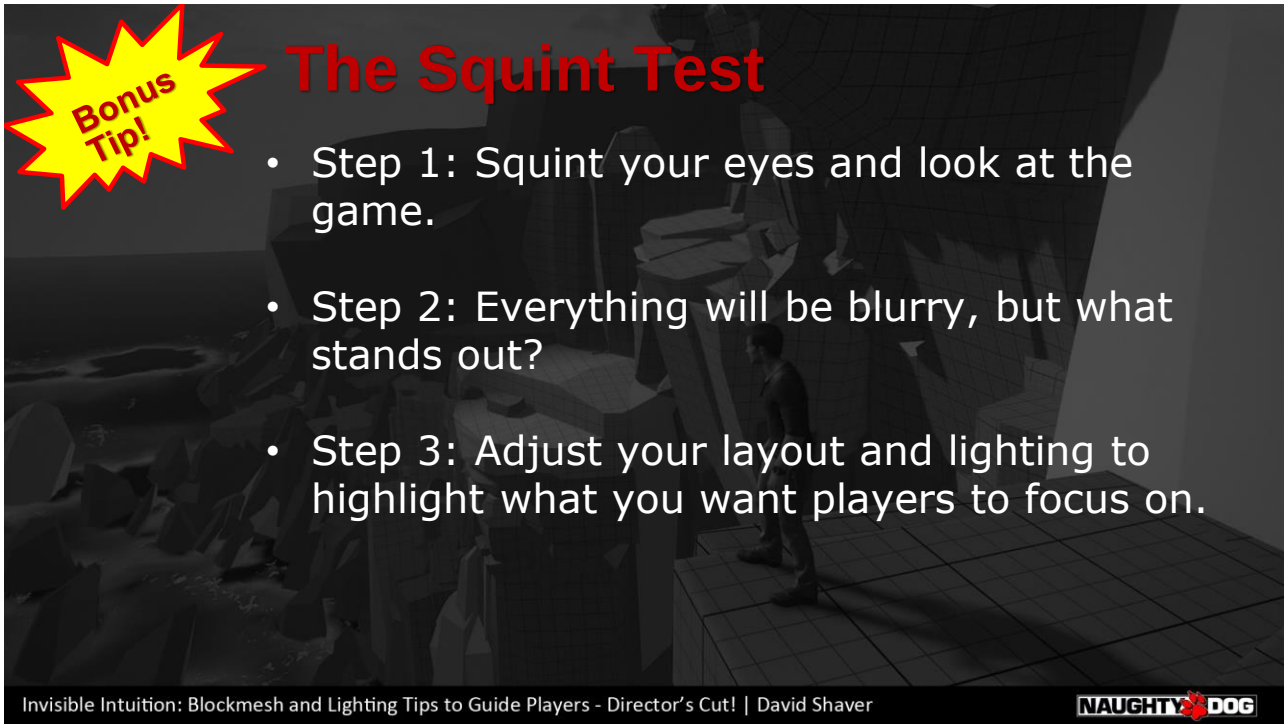
Step 1: Squint your eyes and look at your game.



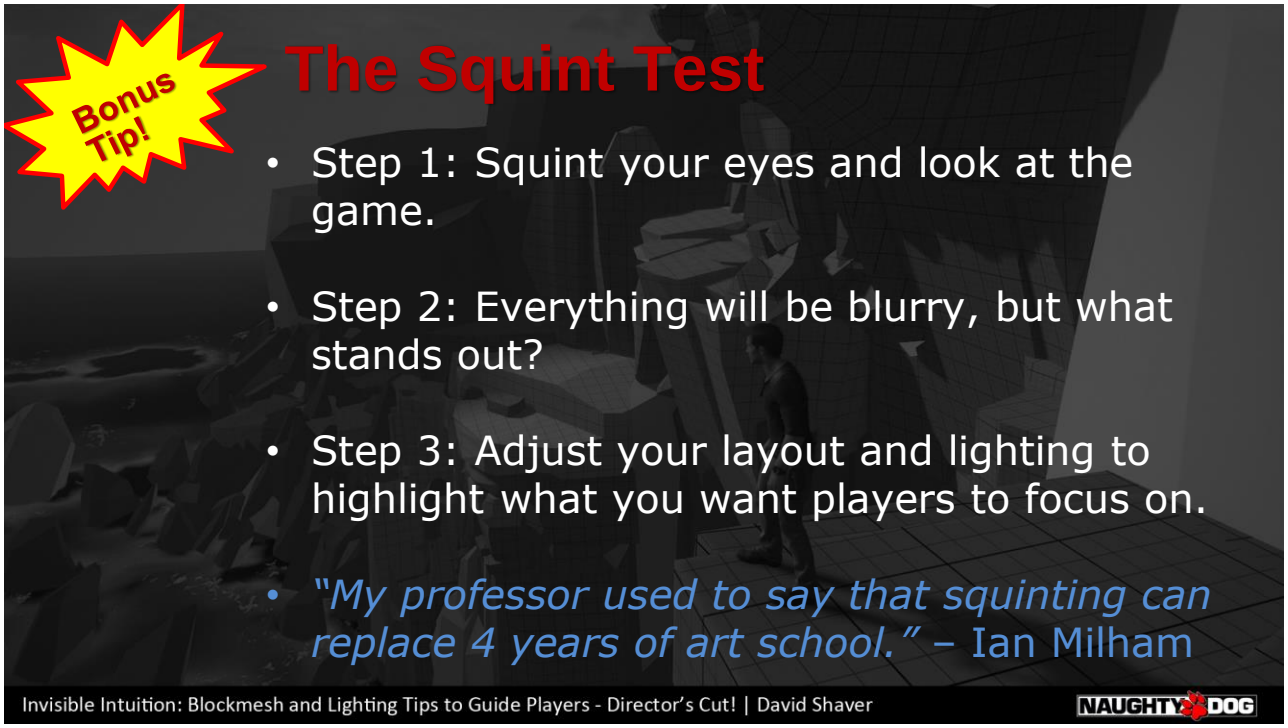
Step 2: Things will be blurry, but what stands out from the blur?

A lit door? A bright yellow truck?

The things that are standing out are the things players will likely notice first.



So, Step 3: Adjust your blockmesh and lighting to highlight what you WANT them to see.



And here's a fun quote Matthias Worch gave me.

"My professor used to say that squinting can replace 4 years of art school."

OK, let's see it in action before we wrap up.

Titanfall 2 – Respawn Entertainment

Here is a shot from Titanfall 2.

Squint your eyes and take note of what stands out.

Go ahead, give it a shot!

…….

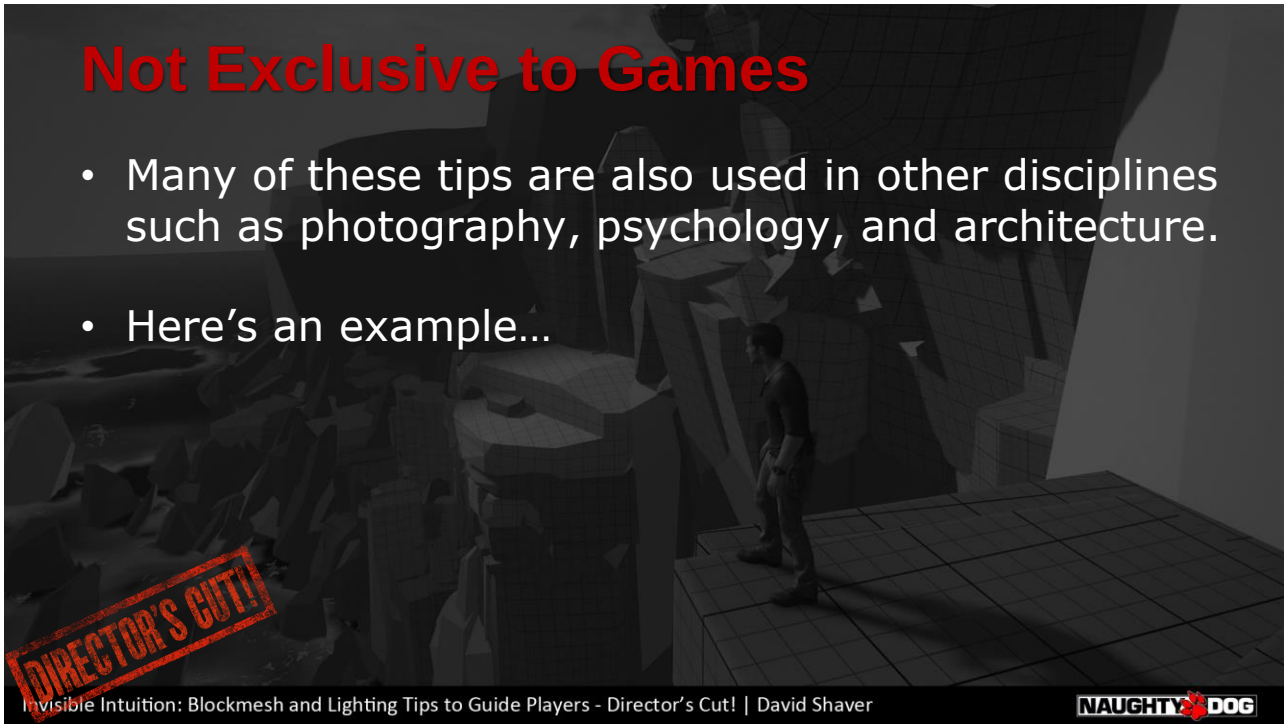
Got it? OK, good.

You probably noticed the yellow walls, the waterfall, and the orange cave opening.

The yellow walls are wall running paths that draw leading lines to the cave.

The waterfall uses movement and sound to grab your attention and also helps frame the cave.

Openings attract, and the cave is lit a different color from everything else in the scene.



ere's an example from Star Wars: The Last Jedi.

Let’s do another squint test on this image.

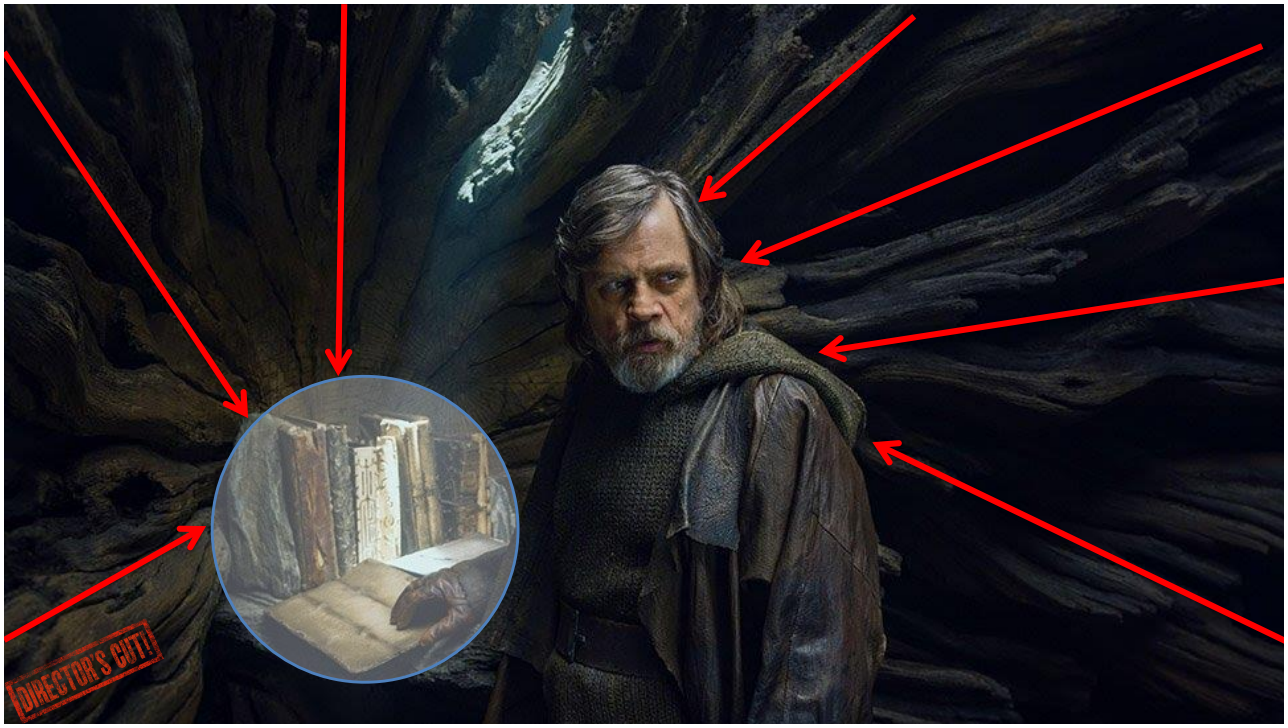
(waiting)

Hopefully you noticed three things: the books, half of Luke’s face (possibly symbolic?), and a sliver of light amongst the overwhelming darkness (definitely symbolic).

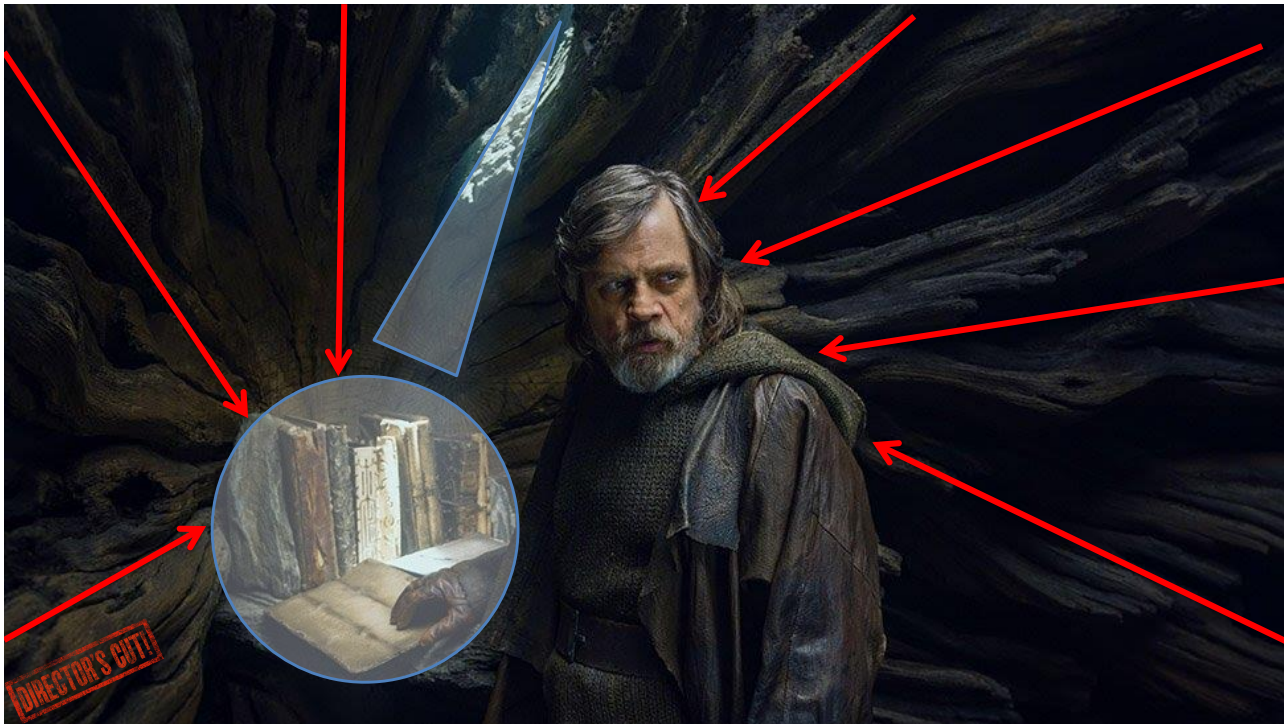
This one image also contains a few

principles we talked about to specifically draw your eye to the books.

First, the tree forms leading lines that point right at the books (and to Luke, but they converge at the books).



Using color and lighting, the books are lighter colored and the rest of the image is dark.

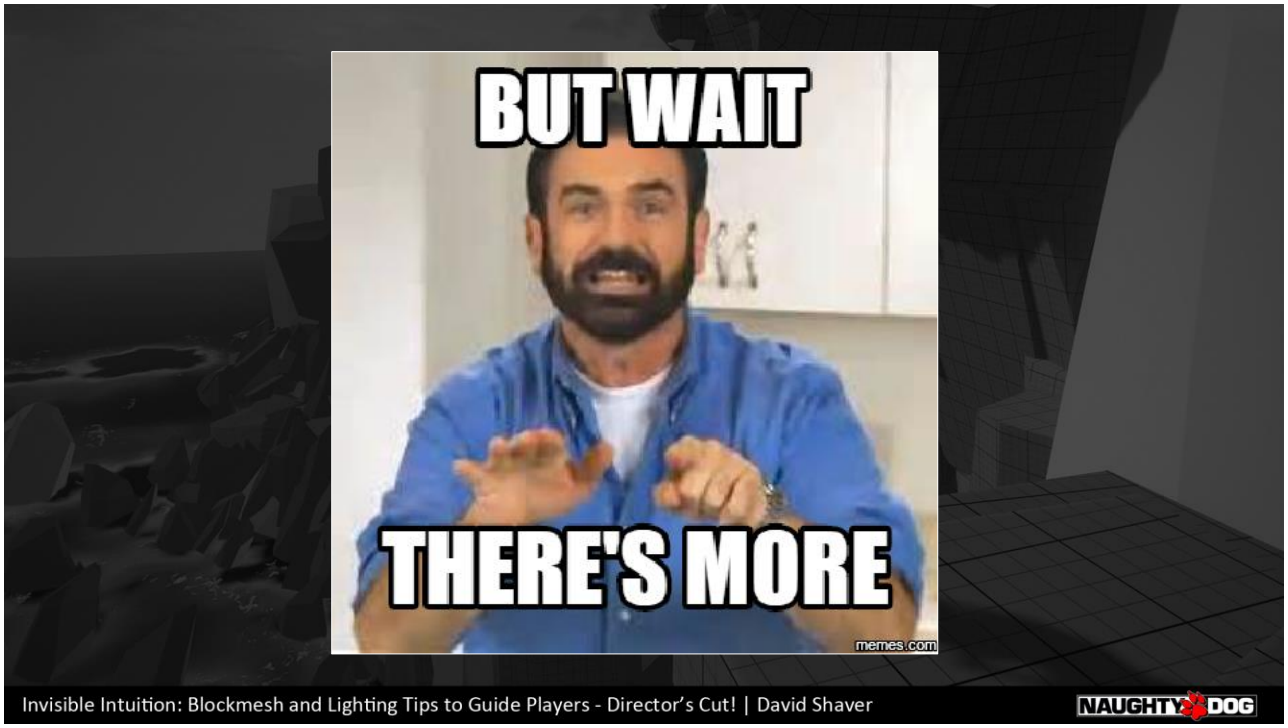


And a ray of light points right at the books through an opening.

Here it is without my markup if you wanna take another look.

(pause)

OK, time to wrap it up.



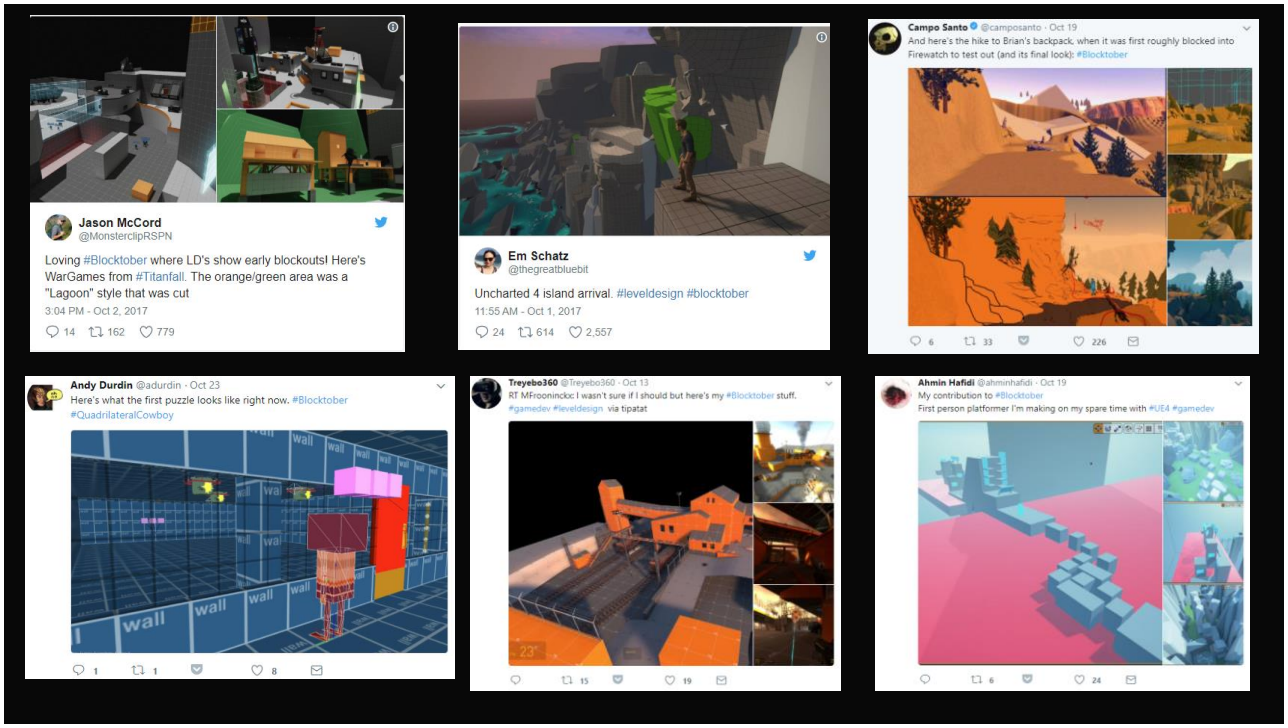
BUT WAIT, THERE'S MORE!

(24:33)

I want to tell you about #blocktober!

Last October, Michael Barclay at Naughty Dog, tweeted this, but in his awesome Scottish accent that I won't attempt:

"What's up level designers. Level blockouts are art. #blocktober should be a thing."



The response was overwhelming. Everyone from hobbyists to AAA devs participated!

#blocktober

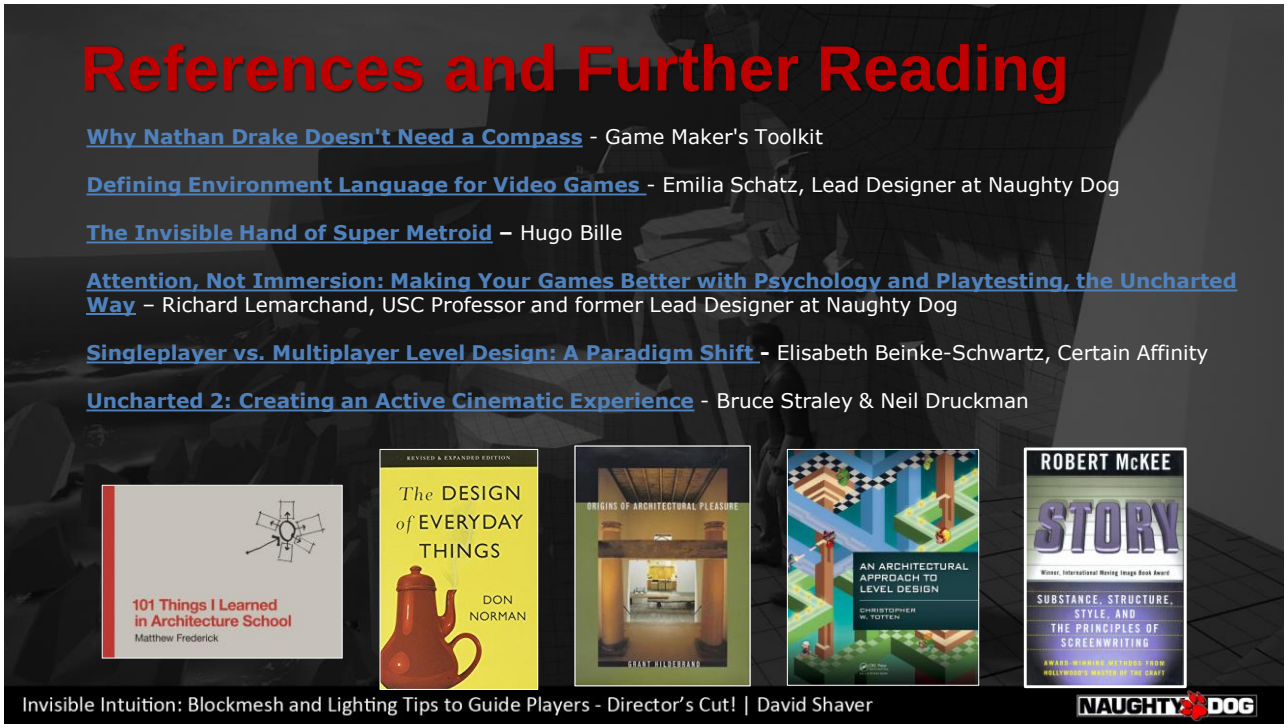
- Follow @blocktoberLD on twitter.
- Start your blockmeshes NOW to show off in October! ☺

I bring it up because it's important to demystify game development and encourage people to make things.

So many people didn't realize that the self-deprecating "crap" they were making looks exactly like their favorite games early in development, and they were inspired to keep going.

#blocktober is happening again this year and Mike created this Twitter account to collect everything people make.

Follow it and get started on your blockmeshes for October!



If you liked this talk, check out these links and books.

If you make multiplayer maps, be sure to check out Elisabeth's talk from last year.

No need to write these down.

I'll have the slides on my website after GDC.

It has some bonus tips at the end too.

Hopefully, you found this talk useful, and I'll see your blockmeshes in #blocktober!

Thank you!

☺

(25:34)

Any Questions?

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