



Earth Echoes Learning Pack

Cultural Strands of the 7th International Conference
on UNESCO Global Geoparks

Nathalie Palin – September 2016



Contents

Introduction

Geology & Creativity in the English Riviera Global Geopark	01
How to use this pack	02
At-a-glance Curriculum Links	03

Music

Every Song Has a Melody	05
Activity: Compose by translating words into melodies	06
Stratigraphy & The Stave	07
Activity: Create your own stave to compose music	09
Activity: Compose a song from shapes in the landscape	10

English & Drama

Physical Theatre	13
Activity: Choral flock work	14
Activity: Choral speaking	16

Script Development

Scriptwriting & Devising	19
Activity: Text Generation & Speed Writing	20
Activity: Visualisation	21

Design

Set Design	23
Activity: Set design & model boxes	24
Costume Design	26
Activity: Costume design	27
Textiles	29
Activity: Explore dyes & pigments from your Geopark	30

Thanks to our funders and Partners



International Conference
on UNESCO Global Geoparks
27th - 30th September 2016
ENGLISH RIVIERA UNESCO GLOBAL GEOPARK



Under the patronage of
UNESCO



Supported using public funding by
ARTS COUNCIL
ENGLAND





Geology & Creativity

Within the English Riviera UNESCO Global Geopark, we have been celebrating geology for several years now through performing arts including dance, music, song, story and drama.

Since 2010, Hugh Nankivell and the GeoCollective have been engaging communities in artistic journeys, workshops and performances inspired by Torbay's geological narrative – travelling as far as Unzen, Japan and Stonehammer, Canada to share their work with the Global Geoparks community and collect sounds from sites across the world.

Earth Echoes has been the next step on this exciting journey – created for the Opening Ceremony of the 7th International Conference on UNESCO Global Geoparks.

The theme of the conference is Health & Wellbeing through Creative and Active Engagement - and the making of Earth Echoes is testament to the role that the arts can play in transforming people and communities.

A large cast of people from across Torbay, from ages 8 to 80, worked with professional musicians and artists across music, performance, film and design. We collaborated with geoscientists, embarked on field trips, learnt new things about the earth, ourselves and each other.

The creative process can be compared to geology and its process. Ideas and activity are laid down, building upon each other, layer by layer – sometimes so slowly that it is hard to see the changes taking place. Sometimes enormous, volcanic explosions of ideas obliterate previous thinking. Great tectonic shifts alter the direction of the creative process and the piece of work.

The arts can play a valuable role in helping us understand 'this rock we live on'. We hope Earth Echoes inspires others to follow our example and develop new interpretations of our unique natural heritage. This learning pack gives you an introduction to some of the processes we have used. The resources here can act as the stimulus for you to take geology into the classroom in new and exiting ways.

Image credit: Doorstep Arts





How to use this pack

This pack is designed for use by teachers and students at Key Stages 2, 3 & 4. Activities link to Music, English, Drama, Geography, Art & Design, and Design & Technology. Many of the activities will support PHSE at all Key Stages. They can be used individually by subject – or combined for cross-curricular, topic-based and whole school learning.

You will find a brief overview of how each creative discipline used geology as inspiration in the making of Earth Echoes. Use these as a thematic starting point for work with your class.

More detailed information is provided in the accompanying materials available on the English Riviera UENESCO Global Geopark website:

- Earth Echoes Musical Score (available under Creative Commons Licence from November 2016).
- Earth Echoes Script (available from November 2016)
- The Making of Earth Echoes: film (available from November 2016)

The individual activities and projects are linked to each creative approach. Break down the individual exercises to suit the needs of your class or 'mix and match' the activities to provide richer cross-curricular opportunities for students to investigate geology across different subject areas.

Many of the activities here are intended to sow the seed of an idea or new way of working that students and teachers can develop into a more extended project if you so wish.

Many of the activities can be used as an extension to the curriculum at Key Stages 4 and 5, and as enrichment opportunities beyond core A-level teaching. Involve your whole school and partner with a local college to develop creative work for an in-school production of your own.

The Rock Connects Us!






Key Stage Links

	Music	Drama	English	Geography	Science	Maths	Art & Design	Design & Tech	Dance	Physical Education
Activity: Compose by translating words into melodies	2 3 4									
Activity: Create your own stave to compose music	2 3 4									
Activity: Compose a song from shapes in the landscape	2 3 4			2 3			2 3			
Activity: Flock work (follow my leader, 1-2-3 Soleil)			2 3 4	2 3 4					2 3 4	2 3 4
Activity : Choral speaking			2 3 4	2 3 4						
Activity: Scriptwriting - Text generation, speed writing			2 3 4	2 3 4						
Activity : Set design and model-box							2 3 3	3 4 4		
Activity : Costume design inspired by Earth Echoes							2 3 4	3 4 4		
Activity: Explore dyes & pigments from your Geopark					3 4	3 4	3 4			



A close-up photograph of a man with dark hair and a beard, wearing a blue and white striped shirt, playing a golden trumpet. He is looking intently at the instrument. In the background, a piano keyboard and sheet music are visible, suggesting a band or rehearsal setting. The lighting is warm and focused on the musician.

MUSIC

Composing & Performing

“It’s important to point out the simple things that people might miss. In *Earth Echoes*, geology is written into the music, even in some of the smallest, simplest ways. The *Geologists* sing in the key of G – G for Geology (of course). In *Torbay*, the bay itself is shaped like a C – an open mouth facing east. So I always think that a melody for *Torbay* would be written in the key of C.”



Every word has a melody

Through the making Earth Echoes, Musical Director Hugh Nankivell led the GeoCollective on a musical adventure, trying out different ways of composing music inspired by Global Geoparks around the world. We used individual words to build songs, created images and staves that were then transcribed into melodies, improvised with instruments, stones and voices, and collected songs that represented geological sites.

From the rich musical material created by the GeoCollective, Hugh Nankivell then composed and arranged the musical score for Earth Echoes. It was performed by Bournemouth Symphony Orchestra alongside the GeoCollective cast, Torbay Brass Band and Curledge Street Academy.

Throughout the fourth Movement of Earth Echoes, a motif of 12 notes runs throughout the orchestral score, overlaid with melodies of 'Abide with Me' (Eventide) and 'Earth's Echo, A Song of Stones' sung by the chorus of humans.

This foundation motif 'spells out' the word ANTHROPOCENE according to a system of composing that Hugh Nankivell has developed whereby "every word has its own melody". The alphabet is set out in columns under the 7 notes A to G.



A	B	C	D	E	F	G
H	I	J	K	L	M	N
O	P	Q	R	S	T	U
V	W	X	Y	Z		

By this system, the word

ANTHROPOCENE

has a melody built on

AGFADABACEGE

The fourth movement is a lament – a reflection on the impacts of humanity on the earth and a call for us to take responsibility for our actions. The ANTHROPOCENE melody is transcribed into F major so the melody arrives at:

AGFADAB^bACEGE

LISTEN to the sound file here for 'What Do We Want to Leave Behind' from the Fourth Movement and follow the Anthropocene melody. You can find the music for this piece in the Earth Echoes score.



anthropocene

Glockenspiel





Composing activity (1)

Compose new tunes through translating words into melodies

1

Think about your local environment and the world around you. Take time to discuss what is important to you about your lives and where you live. Use our scriptwriting activities to help generate ideas so that you know what you want your music to communicate. This discussion could become the basis for some lyrics.

2

Take a key word (or words) and use Hugh Nankivell's system to find the word's basic melody. Some names and words make immediately interesting melodies and tunes. Others make much less interesting ones. Try out different words and see what happens. If you cannot read music, you can always play the tune of your name (for instance) on a glockenspiel or xylophone where the notes are usually already marked with the letters!

3

If your name or the word you've chosen is not so interesting musically, you can still use it as an accompaniment or a bass line for some other music. In *Earth Echoes*, Hugh also translated other words into music, including 'atmospheric envelope' (Bar 53 of the Second Movement 'An Education in Time').

4

Play around with the melody of the word (or words) until you find a rhythm that you like for it. Perhaps try some black notes as well to see if it makes a more interesting or surprising melody. Play with it until you have a starting point that you are happy with.

5

At this stage it's a good idea to write down your melody so you remember it. Transcribe it onto the musical staff so that you can develop it later.

6

From here, you can start to shape it into a piece. It could be the basis for a song, or an instrumental piece where the word becomes a repeated riff and a melody is played against or with it. Shape the piece until you are comfortable with it - and finally perform it.

Objectives

- Compose new music using geology as inspiration
- Use a structured framework (Hugh's word system) as the starting point for melodies
- Creatively develop your melody into a final composition
- Perform in front of your class



National Curriculum Links

Music: Key stages 2, 3 & 4

Try combining with scriptwriting for cross-curricular links with English.



Stratigraphy & the staff

In Earth Echoes, we used the five line musical staff as a motif to represent the strata (layers of rock) in the geology around us. Geology's 'stratigraphic column' shows us a slice through the earth so we can see each rock layer going back through the millennia. In the landscape, you might see these are relatively flat, parallel layers of rock, or as great folded structures that have been bent and broken due to seismic and tectonic forces.

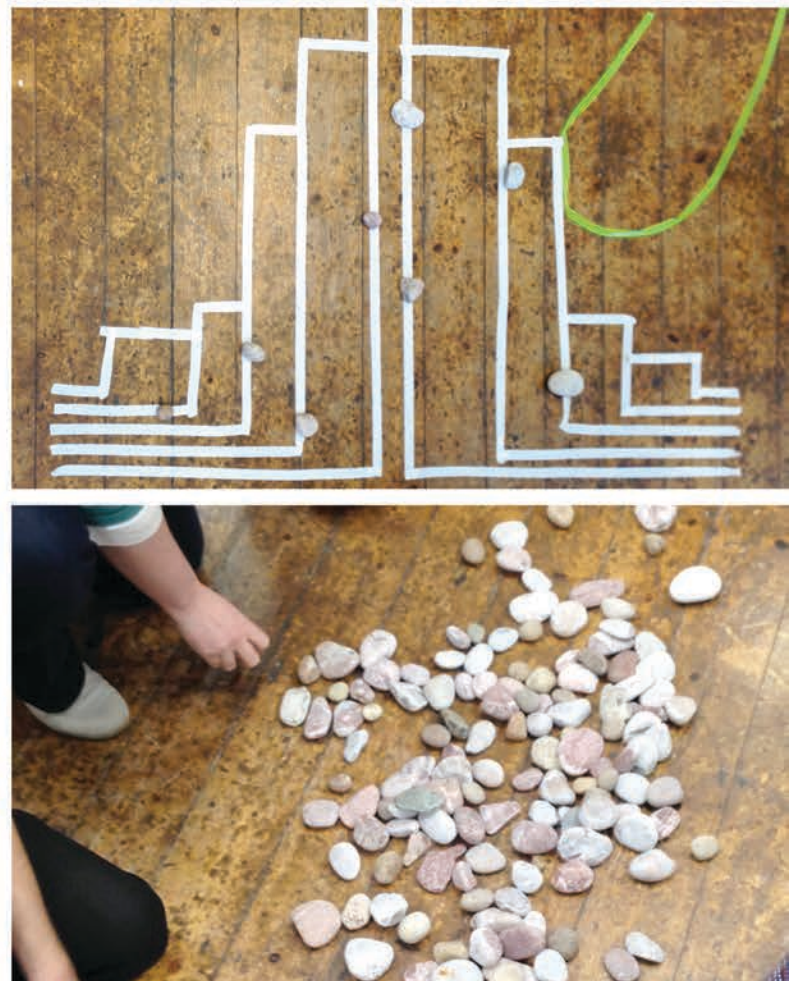
Our GeoCollective composers deconstructed the traditional form of the five line staff and created their own. They made large staves on the floor with electrical tape and placed stones on the staves to represent notes that would be played. They then decided new rules for how to interpret the notation and play music from them. They used stones from our Geopark to mark the notes on the staves. Some were carefully placed, others were rolled onto the staves at random.

In the first movement of Earth Echoes, one of the geologists opens a trap door down into the Earth and, for the first time, music (as opposed to noise) is heard. This music is based on the staff made in electrical tape on the right. A conventional five line staff was placed horizontally across the 'new staff' and this produced the melody shown below - 'Melody from Stones on White Tape'.

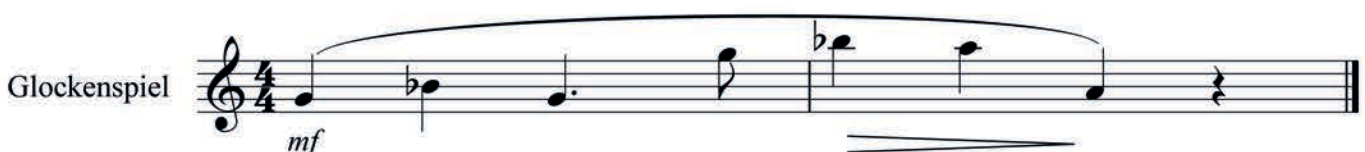
LISTEN to the sound file here for 'Trap Door Time' from the First Movement follow the melody from the 'Stones on White Tape'.



In the opening extract of the score for 'Trap Door Time', the flute begins playing the melody and then the glockenspiel takes it over. In bar 9 (on the second page of the score) it gets taken over by the trumpet and then by page 3, the bassoon (bar 13). Meanwhile, the harp plays a gradually descending line. You can find the full music for this piece in the Earth Echoes score.



Melody from Stones on White Tape





1) Trap Door Time

Earth Echoes - 1st Movement THE HUMAN CONDITION

Hugh Nankivell
and the Geo-Opera Team

$\text{♩} = 72$

Flute *mf dolce* *mp* *p*

Soprano Saxophone

Bassoon

Trumpet in B \flat

Trombone

Triangle *p*

Glockenspiel *mf*

Harp *mp*

$\text{♩} = 72$

Violin I

Violin II

Viola

Violoncello

Double Bass



Trap Door Time, Page 2

6

Fl.

Sop. Sax.

Bsn.

Tpt. *mute*
mf dolce *mp*

Tbn.

Tri.

Glock. *mp* *p*

Hp.

Vln. I *pizz*
p

Vln. II *pizz*
p

Vla. *pizz*
p

Vc.

Db.

Detailed description of the musical score: This page contains the musical notation for the second page of 'Trap Door Time'. It features ten staves for various instruments: Flute (Fl.), Soprano Saxophone (Sop. Sax.), Bassoon (Bsn.), Trumpet (Tpt.), Trombone (Tbn.), Triangle (Tri.), Glockenspiel (Glock.), Harp (Hp.), Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), Violoncello (Vc.), and Double Bass (Db.). The score begins at measure 6. The key signature has one flat (B-flat). The time signature changes from 2/4 to 4/4 at measure 8. The Tpt. part includes a 'mute' instruction and dynamic markings of *mf dolce* and *mp*. The Glock. part has dynamic markings of *mp* and *p*. The Vln. I and Vln. II parts include 'pizz' (pizzicato) markings and a dynamic marking of *p*. The Vla. part also includes a 'pizz' marking and a dynamic marking of *p*. The Hp. part features a long melodic line with a slur. The Fl., Sop. Sax., Bsn., Tri., Vc., and Db. parts are mostly silent, indicated by rests.



Composing activity (2)

Create your own five line stave to compose music

1
Work in pairs or small groups to create new staves using electrical tape, string or marker pens. It helps to work large, to break away from conventions of music notation. Work on the floor, wall or on lining paper.

2
Take the five lines of the stave for a walk. They can remain in parallel, diverge or come together. They can be broken and re-constructed. Maybe a particular theme or motif will inspire your stave – it might take on the form of an object, person or place.

3
Use found objects to populate the stave with musical notes. Inspired by geology, we used stones and pebbles. Try inventing 'rules for playing' your stave. How will you decide which notes to play, how long and or loud they will be? It might even tell you which instruments to play.

4
By now you will have a basic melody taken from the stave and notation. Feel free to experiment and change the rules a little. Find a rhythm that you like for it. Perhaps try some black notes as well until you have a melody that you are pleased with. Then write it down.

5
From here, you can start to shape it into a piece. In small groups, try improvising a piece based on your new melody. Using the instruments you have, each person can add a layer of music, repeating, echoing or contrasting the main melody. If you don't play an instrument, try adding your voice, or use stones or other objects as percussion instruments. In Earth Echoes, our company played stones to describe different moments in the history of the earth. It's not as difficult as it sounds!

6
Practice the piece as a group until you are comfortable and then perform it. If you can, record each piece of music. We tried layering up each piece one after the other and recorded all six pieces made by our GeoCollective playing together at the same time.

Objectives

- Use geological forms at the inspiration for new music
- Create new structures and rules for composing tunes
- Work with others to improvise and develop basic melodies into a piece for performance
- Perform new compositions as a group



National Curriculum Links

Music: Key stages 2, 3 & 4



Composing activity (3)

Compose a song from shapes in the landscape

1
Take a camera or sketchbooks and go out into the landscape. Look at the geology around you and draw the shapes you can see. These might be layers of rock making gentle hills, or great folds, cracks and fissures in a rock face. When the GeoCollective visited Unzen in Japan, they used a volcano as their inspiration.

2
Back in the classroom, use your landscape images to compose a new piece of music. Draw a five line staff on top of your image. Each time a line on your staff crosses a particular 'contour' mark a note on your staff. You might decide that this will be on the silhouette of your landscape against the sky, or it might be where the folds in a strata of rock crosses your staff.

3
Now you have the first line of your melody. Find a rhythm that you like and decide which key you will use. If you are not happy with the melody, try some black notes until you are happy with it.

4
Work together to build the verse of a song made of four or five lines. Decide how the melody will change in different lines of the song, and how it will be resolved at the end of the verse. You could also create a few lines as a 'chorus' that can be repeated after each verse.

5
Inspired by the landscape, write down what you remember seeing and what the place you visited made you feel like. As a group, you can use the text you have generated to write lyrics for your song and chorus. You might have lyrics for quite a few verses. Think about the way you can order them that will tell a story about what you have done or how you feel.

6.
When you are happy with your song, practice singing and playing it and then perform it as a class.

Objectives

- Investigate and draw from the geology in your local environment
- Develop new melodies based on geological forms using creative approaches to composing
- Collaborate to write lyrics as a class
- Perform new music for your school



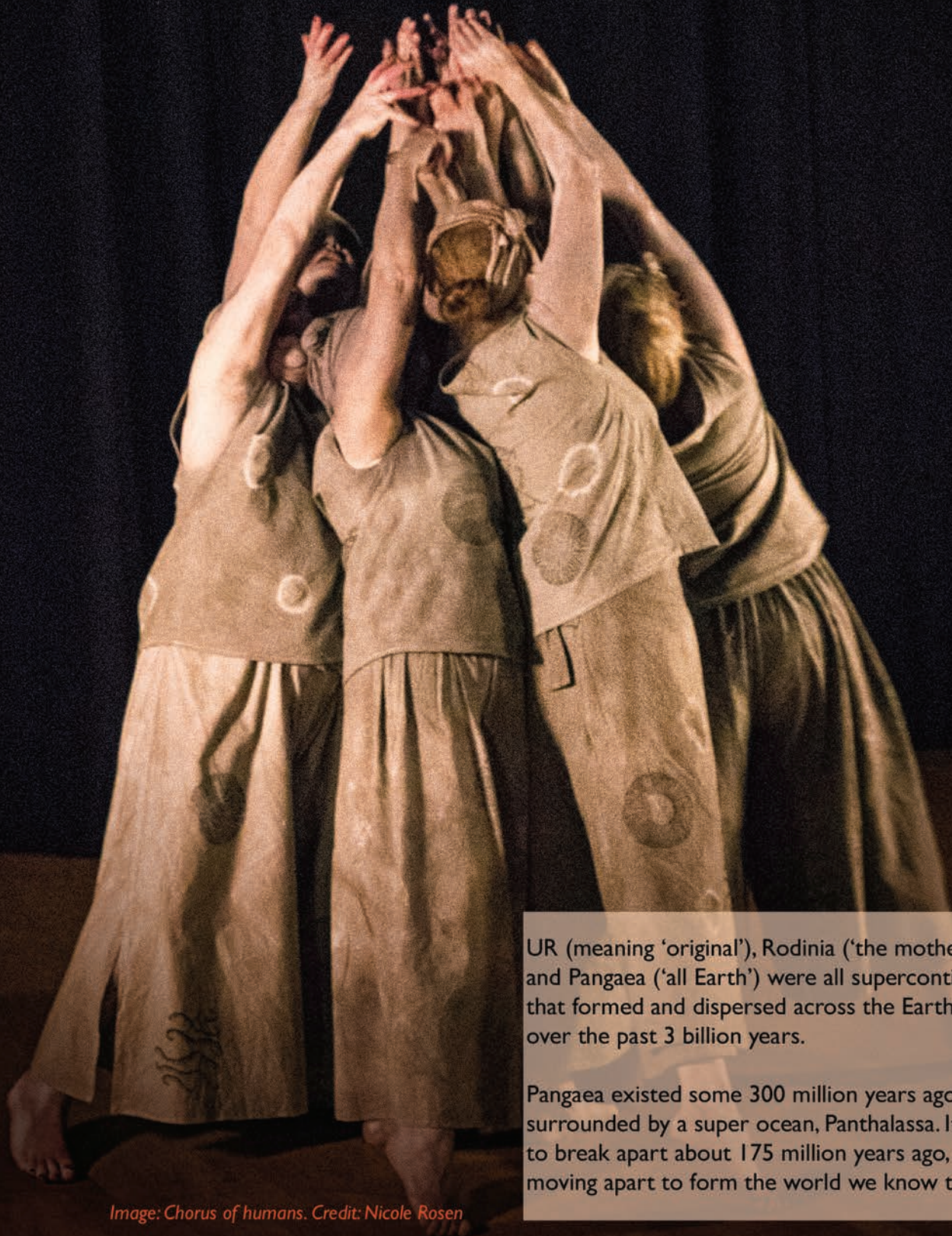
National Curriculum Links

Music: Key stage 2, 3 & 4

Can be combined and enhanced with Geography and Art & Design as a cross-curricular activity at Key stages 2, 3 & 4

MOVEMENT & VOICE

Choral Work



UR (meaning 'original'), Rodinia ('the motherland') and Pangaea ('all Earth') were all supercontinents that formed and dispersed across the Earth's crust over the past 3 billion years.

Pangaea existed some 300 million years ago, surrounded by a super ocean, Panthalassa. It began to break apart about 175 million years ago, slowly moving apart to form the world we know today.



Physical Theatre

Artistic Director Mark Laville drew on physical drama techniques used in Greek Chorus and Butoh theatre to develop our community company of 'humans' to move in unison. This developed the skills and confidence of the company to 'inhabit' the stage using simple, gestural movements and vocal work.

We explored the ways that continents form and separate through bodies moving together and apart. Groups of performers are choreographed to move in unison as one mass or 'continent'.

At times, man-made continents split into smaller groups or individuals and become 'islands' or 'grains of sand'. Slow, controlled movements underline the concept of 'deep time' in comparison with the time we think of in our everyday lives.

As a chorus, the company are mood-shifters, using movement and voice to indicate emotional responses and opinions to the audience, whilst individual 'geologists' lead the main story. To do this, the chorus 'amplify' the lead voice, or they present an argument to the main voice – an 'antithesis'.

Earth Echoes also took inspiration from Butoh, a form of Japanese dance theatre. Butoh encompasses a broad range of techniques for performance and movement. A key concept is that the body is passive and 'moved' from an internal or external source, rather than consciously moving a body part. Through slow, centred movements the company are able to hold the stage as a group. They devised individual gestures based on geological concepts that were joined together to create 'loop movements' for the chorus.

Below: Earth Echoes, moving in unison. Credit: Jayne West





Flock work activities

Our chorus of 'humans' used choral movement exercises to develop gestures for Earth Echoes. Over several months, the community company of actors practiced moving together in unison. These are called 'flock work' exercises as they develop the skills of a group to move together 'like a flock of birds'. Try these with your class as part of your drama or movement sessions.

Follow my leader

A good starting point for choral flock work is an extension of the game 'Follow My Leader'. Whoever is the leader wears a hat or scarf. Everyone must copy the movements of the leader as closely as possible. Whoever is given the hat must take up the role of leader - even if they are unsure what to do and hide or giggle, the rest of the group will begin to mimic them. After a reasonable amount of time as leader they can pass it on.

Step 1: ask the leader to stay in one spot and to move in clear gestural ways that people can copy.

Step 2: allow them to move around the room. For most groups this means that they will form a 'snake' of people walking and gesturing.

Step 3: ask the group to spread out to fill all of the space the room and to follow the leader, but not necessarily by looking at them. This encourages the group to look at each other to get information on the leader's movements, like an 'echo' or ripple effect.

Step 4: ask the group to copy the leader's 'intension' and not their exact movements. For example, the leader might act or gesture to describe fear or joy, or simple day-to-day actions like sniffing, feeling cold or looking for an invisible object. Other members of the group will carry out their own unique gesture that describes the feeling or intension started by the leader.

1-2-3, Soleil

Based on 'Grandmother's Footsteps' this is a great, fun exercise for developing skills in choral work. At one end of the room one person plays Grandmother, with a ball between their feet. All other members of the chorus start at the other end of the room. The aim is for the chorus to creep up, collect the ball and take it back to their end of the room before the ball-holder is identified.

Grandmother has 3 lives to guess who the ball-holder is. Before Grandmother turns around they must slowly announce 1-2-3 Soleil, and can only turn when they have finished speaking. The company must 'freeze', forming a 'tableau', and if Grandmother sees any movement, that person goes back to the beginning. The challenge is to work together as a group to conceal the real identity of the person with the ball.

When the group are familiar with the game, the next stage is to 'connect' the chorus so that in their 'frozen picture' every person is in physical contact with another person - a hand touching a shoulder or even a one finger on another's shoe.

When the group are more skilled than this game, you can try adding in piles of clothes, bags and small items of furniture to the space. As the chorus move towards Grandmother, they must put on the clothing and carry the chairs/other items with them, keeping contact with each other and their objects each 'freeze' to create a scene. On the way back with the ball, they have to put back the objects and clothes in the order they found them.

You can extend this game further, by adding voice - on 'freeze', everyone in the chorus has to make a low sound.

You can experiment and keep adding layers to the rules of this game as the group becomes more and more stilled at working together as a chorus.

Below: Chorus of humans in Earth Echoes. Credit: Jayne West







Choral speaking exercises

In Choral Speaking, a performance group recites a text a one voice. Try the choral exercises below with your class. As a group you can experiment with canon, rounds, pairs, small group or solo sections.

As a starting point, use the two sections in the boxes below, taken from the closing text of *Earth Echoes*. Each member of the group will need a copy of the text to work from.

Geologists speak over the continuing music. They echo their own words in canon.

“The question is, what do we want to leave behind, what do we want our echo to be? We are changing geology, we are changing the world significantly. What do we want our echo to be?”

Singing

We want to leave behind a world where people love
more than they hate
Our voices in the heart of the rock
And a world where we still eat and sleep
Our voices in the heart of the rock
We want to leave behind a world that's not so different
and strange
Our voices in the heart of the rock
And a world where we understand our mistakes
Our voices in the heart of the rock

We may be taller and older and wiser
A rising, an elbow, a knee, a foot
Stories in bodies, a fossil record
We're just asleep, we're resting and dreaming

A remembrance, Earth's echo, a song of stones
A remembrance, Earth's echo, a song of stones
A remembrance, Earth's echo, a song of stones
Responsibility for what we've done
and what will come
A remembrance, Earth's echo, a song of stones
Responsibility for what we've done
and what will come

Vocal warm up

Stand in a circle with a little space on either side of you. Stand feet parallel shoulder width apart. Pull up the spine so you are standing tall with your knees slightly bent. Close your eyes and become aware of your breathing. Are there any points of tension in your body? Focus on breathing without raising your shoulders.

Chew a giant, very sticky imaginary toffee. Then chew one that is tiny. Alternate between the two. Stretch your mouth as wide and then as small as you can. With mouth closed, begin to hum on a low note and be aware of the resonance in your face, neck and chest. This is not about making a polite hum, but waking up your voice so making nasal sounds will help. Change the notes you are singing until you have warmed up the range of your voices.

Introducing the text

Introduce the text. This is not a reading exercise, but one that allows you to explore your vocal potential. Everyone's voice is unique - there is no right or wrong during the following tasks.

Give your group time to read through the text quietly. Then read the text aloud together. This allows everyone to feel familiar with the wording in a safe environment.

Read the text in a circle with each person reading one line in turn. At this stage, the text might sound quite 'dead'. This is normal - it takes time to get over the hurdle of speaking text aloud 'one line at a time'. Ask everyone to memorise their line, and the line of the person who comes before them so they know when to speak. Try the whole poem aloud a couple of times so that everyone can do it without the text - the sooner the script is put down the better!

Now, in a circle, get the group to speak their lines (in order as before), but now with the feeling that they are all telling each other a story. Try to paint a picture for the class - "imagine you are sitting on round a campfire, telling this story. It's evening time. You can hear the sound of the sea in the distance."



Choral speaking exercises

Presenting the text

Split the class into two groups, giving one section of the text you have been using to each group - so they work on different pieces and present to each other. Give the groups half an hour to develop their performance. As a chorus, they will practice speaking their text and acting it out using simple movements and gestures.

They can decide which lines will all speak together and which will be delivered by individual speakers. All should speak some part of the text. They can experiment with different choral speaking techniques, where speakers repeat isolated words or 'echo' phrases. Some lines might be whispered or loud, they might vary the pitch or rhythm of their voices. As long as the main text is still clear in the presentation, it can be echoed and added to.

To help the groups find gestures to act out, it is helpful to think about what the text means to them. Ask them to close their eyes and read the text to them. What feelings do they want to communicate when they perform it? Ask them to agree one main 'mood' that they will try to get across to their audience. They can agree some simple movements that describe feelings and actions that bring the meaning of the text to life. The chorus moves together acting out gestures 'in unison'.

Now the groups can present their work to each other. Encourage each group to make a still 'picture' before they start, so both actors and audience are prepared. Allow a moment of 'still' time at the end for the piece to close. For encouragement and feedback, give one positive comment and one suggestion for improvement.

Extension activities

The group can write their own response to "What do we want to leave behind?" using our Scriptwriting activities. Then, in small groups, the class can direct themselves using their own text, paying attention to how they deliver it. The class can watch each other's work and feed back how the piece made them feel when it was performed in a particular way.

These choral speaking activities are based on exercises from 'Teaching Voice' by Max Hafler. This book is a great resource for developing young performers.

Objectives


- Develop group-work skills, listening and cooperating with others to work as a chorus
- Interpret prose/poems to communicate meaning through voice and gesture
- Develop vocal skills to speak, sing and combine voices
- Build confidence to present a performance



National Curriculum Links

English & Drama: Key Stage 2, 3 & 4

Extend into creative writing through combining with script development activities. Through selection of texts used, can support PHSE at all Key Stages.

A group of diverse young people, including a boy and several girls, are gathered around a book. They are looking at the pages with interest and focus. The scene is lit with warm, soft light, creating a cozy and collaborative atmosphere. The text 'SCRIPT DEVELOPMENT Creative Writing' is overlaid in a white, handwritten-style font at the top of the image.

SCRIPT DEVELOPMENT

Creative Writing

The Earth Echoes script was developed through collaborative writing and devising activities. Using visualisation, text generation and 'speed writing' exercises, we created a script that tells the story of the Earth, but also the way we understand it and our hopes for the future of the planet.



Script Development

Deep time – a history of 4.6 billion years – is a difficult concept for humans to understand. Earth Echoes needed to be a story that we could all relate to. To be interesting for our audience, it needed to be meaningful and memorable.

We asked a few key questions as starting points from which to develop our script:

- What makes me feel significant? What makes me feel insignificant? These questions were posed with reference to the history of the Earth, but also in terms of our everyday lives as human beings – our daily worries and pre-occupations.
- What do we imagine the world to be like in 250 years?
- What do we want to leave behind? What will the fossil record of humanity be? This question encouraged the group to think about emotional and social remains as well as material or organic ones.

From these starting points the GeoCollective developed script materials through visualisation, speed writing and collective text-generation exercises.

This material was then refined and edited into the final script alongside music composition and rehearsals.

Images: Scriptwriting & rehearsals.credit Doorstep Arts



How do you feel when you listen to music?

We asked the GeoCollective composers, “How do you feel when you listen to music?”. Each person shared their answer with the group. These short responses were compiled and re-read as a collective poem. A section of this poem is included in Movement 1 of Earth Echoes:

[A geologist goes to a trap door. He opens it. Slowly it opens. Light comes out. Music comes from below and swells upwards. There is a full 90 seconds – 2 minutes of the most profound music (performed by BSO orchestral players.)]

Geologists: What happens to you when you listen to music ? What happens ?

*Humans: I get lost, I drift,
I find myself
floating.
Everything opens up
inside me and outside of me.
I feel like I am connected to the whole world
- connected to the universe.
I am transported.
It makes me feel significant
and insignificant
All in the same moment
In the same moment!*

Geologists: Understanding time is like listening to music.





Scriptwriting activities

The three activities here are a great way to generate new material that you can use as a starting point for developing scripts, poems or prose.

Text Generation

1
Carefully chose a prompt question linked to geology and the natural world (or another theme you would like to explore). Look at the prompts we used on the previous page to give you some ideas.

2
Working around in a circle, record everyone's responses (as ad verbatim as possible) on a flip chart or on paper. Fairly short responses of up to 10 words each will work well in a classroom setting.

3
Without editing or reorganisation, present the responses back to the group as a collaborative poem or piece of prose read aloud. What thoughts does this prompt? Is the group surprised by the writing created? What new thoughts does the group have about the theme? Bringing everyone's opinions together often changes the way we think about them individually. This is an opportunity for all to investigate our understanding and perceptions of the subject matter.

4
To extend this activity, each person can then go on to develop an individual piece of creative writing - using the collaborative poem as a starting point, along with their thoughts on the group discussion. This could be a poem, a piece of open prose or a section of dialogue for a play.

5
Now everyone can recite or perform their work to the class. The group can provide feedback to each others work and ideas. You can use this approach to generate work for a simple poem, a substantial play, or a session focusing on personal and social development.

Speed Writing

We used this speed writing exercise in Earth Echoes to put together a shared mental picture of our hopes and dreams for the future of the planet.

1
Everyone in the group will need a pen and paper. And some simple Speed Writing Rules.

2
Decide on a prompt question and a 'hook-line'. For example: the prompt we used in Earth Echoes was: 'What do you imagine the world to be like in 250 years?'. Everyone began with the hook-line "In 250 years ..."

3
Speed Writing Rules: for three minutes everyone must write constantly without stopping and without taking their pen off the paper. If you run out of ideas, write the 'hook' again and again until you regain your writing flow and then you carry on. It's important that you don't stop and think about what you are going to write as it will interrupt the stream of consciousness you are engaging in this exercise. Whilst you are writing, don't worry about proper spelling or punctuation and don't worry about whether you are writing 'great work' or not.

4
Set the timer and write for three minutes.

5
Ask each person to read aloud some or all of what they have written to the group. Often people will edit down to what they are happy to read out loud.

4TH MOVEMENT:
WHAT DO WE WANT
TO LEAVE BEHIND?



Scriptwriting activities

Visualisation Exercises

Visualisation exercises help us to access new thoughts and ideas by unlocking our subconscious imagination. Writing for Earth Echoes, we used Visualisation to look at the question “What do we want to leave behind? What will the fossil record of humanity be?”. This activity allowed the group to think more poetically and philosophically about the question. Rather than thinking of remains such as bones, objects and plastic, ideas included: “I want to leave music in the stratigraphy” and “I want to leave behind a world that’s not so different and strange” in Earth’s fossil record.

1
Decide on a question that you will use as a prompt. For this exercise, a good prompt will provide rich opportunities for more poetic and philosophical responses. Write it on the board or a flip-chart as a reminder to the group.

2
Ask everyone to shut their eyes. Describe the context and environment to feed their imagination. Use detailed descriptions to create atmosphere. For our ‘fossil record’ question, we described the environment of being deep inside the Earth and then imagined slowly coming up the surface.

3
Once you have set the scene, everyone can open their eyes. Without any other discussion or distraction, ask everyone to spend ten minutes writing down their responses to the prompt question.

4
As a group, share a selection of your responses aloud and record them on paper. Use the thoughts and phrases to create a collaborative poem. In small groups or as a class, you could use these to write the lyrics of song or piece of dialogue.

Objectives

- Generate new creative material through collective poetry, visualisation and speed writing
- Share ideas and work collaboratively with others
- Develop a personal creative response
- Recite and share your work with your class



National Curriculum Links

English & Drama: Key Stage 2, 3 & 4

Select prompt questions to support PHSE at all key stages, providing opportunities to explore identity, empathy, personal and social responsibility.

Combine with music composition to create song lyrics for a cross-curricular approach to English and Music.

SET DESIGN

Layer by layer



In the Earth's geological column, rocks are stacked in layers providing a vertical timeline of the history of the Earth. At the bottom are the rocks and minerals of earliest Earth, then much later, the fossils of ancient primitive creatures.

Moving towards the surface, we find fish, then amphibians, then reptiles, mammals, birds, and finally modern mammals including humans. Whilst layers are usually deposited in a clear order, they are often disturbed by later activity – by volcanoes, rivers, mountains and shifting continents.

Image: Drawing by Jacqueline Slade



Set design

For the set of Earth Echoes, designer Jacqueline Slade took inspiration from huge rock structures in the landscape, as well as architecture and sculptural forms.

Her sets are built up in layers to mirror the layers of geology that tell us the history of the Earth. Around the stage, rock and fossils are painted onto the surface textures. A 'five line stave' runs through the set, banners and projections like a 'golden thread' reminding us of the connections between geological layers and the layers of music that tell the story.

Some parts of the set are built by the performers during the performance, adding layers as the story unfolds. Performers climb over the geological 'stack', opening a trap door taking us down into the Earth.

These parts of the set need to be stable, strong and 'buildable' by performers on stage, whilst creating a magical environment. Using simple materials, strong shapes and colours, the set comes to life under the stage lighting. The set, projections, lighting and 'dry ice' all work together to add to create the drama of the final performance.

In the opening scene, the humans are born out of the rocky landscape. Taking inspiration from Christo's landscape sculptures, Jacqueline used simple drapes to cover the bodies on stage, creating the impression of a vast landscape using light materials that are practical to work with.

Left below - Geologist opens trap door to set stack, Doorstep Arts.
Below - section of Jacqueline Slade initial design for Earth Echoes.



Painted banner across space to cover void.

Timust stage

Blocks built to create a



Set design activities

How would you create a world that brings geology to life on stage? Use the themes of Earth Echoes as a starting point for a design project with your class. Your stage could be at school, in a theatre or 'open air'.

Set designers normally work to a brief given by the Director. Set design challenges are a great way to test your creative skills to solve practical challenges.

1
Work as a class to develop a mood-board of images and ideas for your set-designs. Images from nature, the arts, sciences, architecture, even everyday objects - they can all help you find practical construction ideas as well as inspiring the textures, forms and colours of your designs.

3
Draw the design of your set. Try to 'set the scene', describing the atmosphere that you want to create on the stage. You can extra sketches or diagrams to show how you would build different parts of the set. Think about how actors will move about and whether the audience will be able to see the stage from where they are sitting (the sight-lines). Where are the entrance and exits for performers? Will the set change at all during the performance?

4
Next, you can make a 'model-box' - a 3D model of your set design on stage. You could use a pre-made box (such as a shoebox) for a scale of approximately 1:50. At Key Stage 4, you could make a 1:25 scale model - this is the perfect scale for designers to show details of a set and work out any problems before they build it full size.

5
At Key Stage 4, you will want to think about more practical details - will the materials, colours and textures look effective on stage and under lighting? Is it safe and stable? Will actors be climbing on any parts of the set?

6
Try lighting your sets by positioning mini torches as 'spotlights', and then photographing them. Imagine that you have shrunk to the size of the set and can walk around it. Simple silhouette cut-outs of your actors will help bring your scene to life.

Objectives

- Use geology and the natural world to inspire designs for sets, through visual research & drawing
- Communicate and problem-solve design ideas through 2D designs and 3D models
- Use maths to work out correct ratios and measurements to build a scaled 3D model box
- Investigate the physical properties of materials suitable for set-design
- Use photography and lighting to play with scale and bring your models to life



National Curriculum Links:

Art & Design: Key Stage 2, 3 & 4
Design & Technology: Key Stage 3 & 4
Maths: Key Stage 3 & 4

Combine with Scriptwriting activities for a cross-curricular approach to English at all key stages.

For larger projects, you could partner with your local college to build one of your set designs for an in-school production of your own.

COSTUME

Rocks, Humans, Children, Geologists



Images: Humans design drawing Jacqueline Slade;
Humans in costume Earth Echoes - Credit Jayne West.



Costume Design

The cast is made up of four character groups – rock, humans, children and geologists. Each group has its own personality and way of behaving. These provided the starting point for Jacqueline Slade's costume designs:

ROCK (the choir and orchestra) stays in the same position throughout. The three rock forms are: igneous, sedimentary and metamorphic. Rock textures were created by cutting and sewing fabric back together, then dying and hand painting. These needed to be easy to wear so musicians could play their instruments.

HUMANS are grown from the heart of the rock. They are organic creatures and they move as one body. They are led by their geologist guides. Their movements are based on the Japanese dance technique Butoh and their costumes are inspired by traditional Butoh dress.

CHILDREN represent the Earth and our hopes for her future. They are dressed to represent the land and water that make up our planet.

GEOLOGISTS are 'Earthly Astronauts' helping us to understand 4.6 billion years of the history of the planet. They move through time, past, present and future. Their costumes are steam punk Victoriana style with gadgets and goggles. They are most human in their appearance.

To bring these characters to life, Jacqueline drew on a whole range of design references: from historical photographs, fashion and architecture, to sculpture and the natural world. From the images here, you can compare her initial design drawings with the final costumes worn by the company.

Images: Jaq Slade designs for Children & Rock; production costumes Children & Rock, credit Jayne West.





Costume design activity

In the classroom, geological forms can provide a starting point for your design work, just as we have done. Use the script of *Earth Echoes* as a starting point for your design project, or write a new script in your English class that you can use as inspiration.

Great costume design brings a character to life through clothes, make-up and props, so it helps to have some clear character descriptions to work from.

1
Work together to create a mood-board of colours, forms and textiles that will inform the costume designs of the group. Make connections with the wider world, natural and man-made, and with artists and designers. As a group, this will help you to agree what the 'look and feel' of the costumes will be.

2
Each take a chosen character and design a costume for them. Think about how physical clothing and any props will help you to represent the personality of the character. Just like the *Rock and Children in Earth Echoes*, you might be designing for a 'symbolic' character, rather than a person. Shut your eyes and try to imagine being inside the character to help bring them to life. Make-up, hair and props are all important elements that will complete your overall costume.

3
At Key Stages 4 & 5, you will be wanting to think about more of the practicalities of your costume. Will the materials, colours and textures be effective on stage and under lighting? Is the costume wearable? Will the performer be able to move comfortably to perform?

4
Share your work with others to help you think about how different costumes (and other elements, such as sets) will work together to make a whole.

5
As an extension to this activity, you could go on to make these designs into garments as part of your Costume or Textiles course.

Objectives

- Create new design work using Earth Sciences as a inspiration
- Collaborate with others to design costumes that compliment each other for a production
- Work 'to brief' combining creative ideas with practical problem-solving to design wearable costumes



National Curriculum Links

Art & Design: Key stage 2, 3 & 4 (Textiles)
Drama: Key Stage 2, 3 & 4
Design & Tech: Key Stage 3 & 4

Combine with Scriptwriting and Set Design activities for a cross-curricular approach to Art & Design with English & Drama at all key stages. Combine with Pigments & Dyes activity to integrate Art & Design with Science & Geography.

TEXTILES

Natural pigments & dyes

For centuries, humans have used nature, soils, rocks and plants as both the inspiration for creative work and the material used for dyes, paints and the canvas on which to work. Geology also informs the flora and fauna (plants and animals) that live on the surface of the Earth – so locally grown plants make direct reference to the earth beneath our feet.



Natural Pigments & Dyes

Textile artist Sam Aspden led a team of students to create unique fabrics, dyed with natural materials from the English Riviera UNESCO Global Geopark. From these natural materials they managed to achieve a broad spectrum of colours and tints:

Permian Devon Red	Devon Red/Terracotta
Lady's Bedstraw	Pale olive green
Bracken	Cream to pale browns
Marigold	Pale to bright yellow
Elderberries	Lilac to pale purple
Red Onion Skins	Cream, yellow, orange
White Onion Skins	Yellow, orange, peach
Gunnera	Green-brown to grey-black

The Permian Devon red soil was ground down and sieved to a powder pigment before being mixed with a binding agent. The onion skins, bracken and other plant-based materials were soaked in overnight in a dye bath and boiled with a mordant - either salt and alum or with copper.

These natural pigment dyes are combined with soya milk used as a binding agent following an ancient Japanese technique. These dyes and pigments were used to create many of the create costumes for our Rocks and Humans, as well as for banners that clothed the walls of the auditorium.

Additional process notes

In almost all cases, Sam recommends that you dry the natural dye materials/plants before use. Chop them into small pieces, tear or shred. Then boil them up in water for approximately 1 hour and leave to simmer – the longer simmer the stronger the dye. This is an opportunity to experiment. You will need between 50% and 100% of dye materials per volume of fabric. Add either iron (to darken and deepen colours), copper (to brighten/yellow colours), alum or wood-ash water (for bright, vivid colours). Add salt to fix in all cases. Add the fabric. If you leave dye materials in the water you will achieve a 'tie-dye'. Strain off the plants and then dye with just the infused water for a smooth even dye. Simmer for 30 mins to 1 hour for pale shades. For darker shades, simmer for 2 hours and leave in to cool overnight.





Pigments & dyes activity

Natural Pigments & Dyes

- 1
Find out about your local environment – which soils, rocks and plants are specific to where you live? Could you use them as a pigment or dye? Are they safe to experiment with?
- 2
Go on a field-trip to collect materials from the local area (contact your Local Environment or Geopark Officer who will tell you what you can and can't collect). Contact a local allotment for onion skins, or bring them in from home.
- 3
Back in school, make sure you have the necessary resources: binder, stoves/burners, measuring jars and bowls, stirring implements, sieves, drying racks and protective materials. Then work in groups to prepare each dye and follow through to the stages of fabric preparation, dyeing and drying.
- 4
Experiment with combining different colours to create new shades & tints. Try creating patterns through tying the fabric, using rubber bands or a resist material such as wax. Think about what the fabric might be used for to help inspire you to make patterns and textures that you can use for a particular costume or other design.
- 5
Record the characteristics of each material – from your initial finds, and through the processes of grinding, soaking, dyeing and fixing. Which pigments and dyes produce the strongest colours? How do different fabrics react? What can you deduce about the chemical properties of soluble dyes and insoluble pigments?

Objectives

- Research and collect geological and natural plant materials in your local environment
- Investigate physical properties of organic and inorganic material as dyes and pigments.
- Experiment creatively with natural dyes and pigments, exploring colour, tints/shades and pattern.
- Evaluate and record the properties and effects of the natural materials used.



National Curriculum Links

- Art & Design: Key Stage 3 & 4
Science: Key Stage 3 & 4
Geography: Key Stage 3 & 4

Use this as a cross-curricular activity combining Geography, Art & Design and Science at Key Stage 3 & 4. Extend into Costume and/or Set Design at Key Stage 4.

Elements of this activity can be delivered at Key Stage 2, but certain processes are not suitable for younger children: use of certain mordants and a stove for heating dyes & fabrics.