Steve Reich

KS4/5

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Introduction

The activities covered in this resource can be adapted for use across all key stages in secondary schools. They are particularly relevant for supporting GCSE and A level study and, indeed, most examination boards make specific reference to minimalism, including:

- AQA GCSE AoS4: Steve Reich's *Clapping Music*
- AQA A level AoS7: Reich as a named composer
- OCR A level AoS6: Reich's *Different Trains*
- WJEC GCSE Aos3: minimalistic techniques as used in film music

Background and *It's Gonna Rain*

During his student years in the late 1950s and early 1960s, Steve Reich, like many of his contemporaries, was obliged to study 12-note music. He soon became disenchanted with serialism as a compositional process, but he did take from these studies ways of working with rhythm patterns based on 12s, and also the idea of working with a limited gamut of notes.

Moving on from the earlier work of John Cage and other composers, Reich became interested in setting up systems where simple musical phrases and rhythmic patterns were repeated and layered, with instructions regarding how these repetitions were to be very gradually modified over time. Once the pieces had been set in motion, the process would automatically take over.

This resulted in what Reich refers to as the 'by-products' of process – formed by the superimposition of patterns. These superimpositions lead to the formation and emergence of perceived sub-melodies, resulting from elements of echo, resonance, dynamics and tempo, and the general perception of the listener.

An important encounter at around this time was a meeting with Terry Riley. He and Reich discussed a new piece Riley was working on called *In C*. It was Reich's crucial suggestion to add a repeated quaver pattern on the note C, played by Reich on a marimba, at the 1964 premiere performance. This work was to become an important influence on Reich's compositional explorations, and he began working on pieces combining repetitions of small musical fragments.

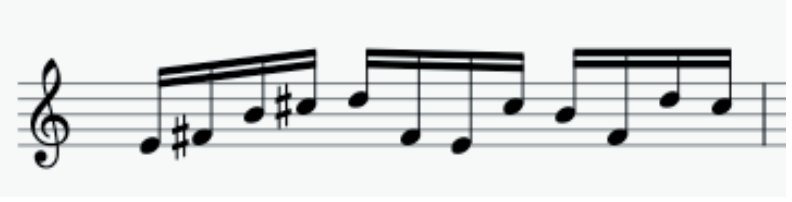
This led to what Alex Ross describes as Reich's real 'eureka moment', which came when he made a field recording of a black Pentecostal street preacher delivering a sermon about the Great Flood. Reich was particularly impressed with the musical quality of Brother Walter's speech style, and he made a tape loop of one particular phrase – 'It's gonna rain'. His intention was to make two copies of this loop and have them play on two tape recorders, where the first machine would begin by playing 'It's gonna', while the second machine began playback on the word 'rain'. The corresponding outputs would feed into the left and right channels of a pair of headphones.

However, two problems emerged from the outset. First, both machines actually started playback in unison. Secondly (due to slight differences in tape loop length or tiny variations in playback speeds of these two inexpensive tape recorders), the loops started to go out of sync, with one machine gradually getting ahead of the other. The result is a mesmerising work – *It's Gonna Rain* (**www.youtube.com/watch?v=vugqRAX7xQE**) – lasting about 16 minutes in which the phasing vocal parts set up a series of gradually changing canonic relationships.

A final note: a 'happy accident' occurred during the making of this field recording. A pigeon happened to fly close to the microphone during the recording of this short extract. You can hear the fluttering effect create a kind of drum loop underscoring the performance. As a percussion player, Reich was more than happy to have this welcome bonus to the recording. How many of your students can hear this? Without prompting, can they suggest the source of this sound?

Piano Phase

Encouraged by the success of this process, Reich turned his attention to applying these musical procedures to instrumental music. One of his first pieces in this style was *Piano Phase*. He wrote a short musical loop of 12 notes, using five different pitches. Left and right hands alternate in playing the notes of this pattern on a piano:



He recorded himself playing this pattern and arranged playback on a tape loop. He then attempted to play this pattern on a piano – starting in unison and gradually increasing his tempo so that he went out of phase with the taped version. He found that with a little practice, he was able to do this. The next step was to have the piece performed live as a piano duet. Here (**www.youtube.com/watch?v=io345c6zNfM&feature=youtu.be**) is an example of a live performance.

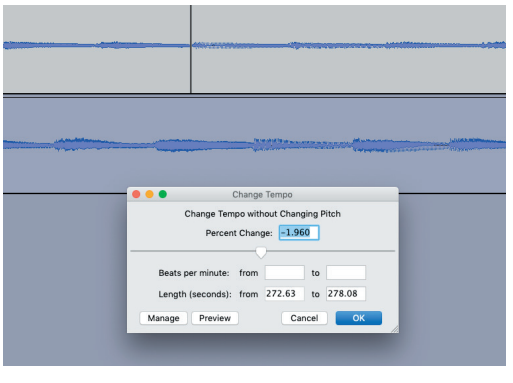
Reich's early music: activities

Recreating *Piano Phase*

It's highly unlikely that you will find students in your class who can perform *Piano Phase* as it stands. However, we can use music technology to emulate the procedure:

- Students record the above 12-note phrase into an sequencer or audio editor program as a midi or audio file.
- Copy the file to another track.
- Stretch the length of one of the files by a very small amount.
- Loop the tracks and playback.
- Adjust the length of the stretched file and/or the playback tempo until a satisfactory result that sounds similar to the original Reich version is achieved.

Most sequencers will have the facility to do this. This screenshot shows how it can be done using Audacity, by adding Effect/Change Tempo.



Composition activity

Students should now write an original sequence of 12 quavers, using only a few different pitches. Study carefully the Reich example above. Note how the sequence uses leaps as well as steps between notes. Using some leaps helps facilitate the impression of short bass and treble riffs being generated by the process. Record the sequence as an audio or MIDI loop into a sequencer. Copy the loop and stretch it by a very small amount. Experiment with different instruments, tempos and panning to achieve a satisfactory musical outcome.

Working with vocal samples

One of the reasons that *It's Gonna Rain* works so well is because Reich chose a musically interesting vocal sample. If you listen to archive recordings of great orators or evangelical preachers, you're likely to hear impassioned deliveries with strong rhythmic phrasing and richly varied intonations. You can hear this in the speeches of Martin Luther King, Winston Churchill, Nelson Mandela, Barack Obama and many others, including accomplished actors reciting poetry or delivering speeches from Shakespeare. Listen to Brian Eno and David Byrne's 1981 album *My Life in the Bush of Ghosts* (**www.youtube.com/watch?v=9K7oatreY7s&list=PLL7DCiqr-NKCFO9p82TTst8kEYdp6tWLb**) for examples of how vocal samples can be woven into new musical works.

Students should next record a short vocal fragment from an archive recording or create an original sample. The process for creating a minimalist piece from this is exactly the same as for the previous activities working with instrumental sounds.

Calculating the length of these pieces

Music generated using these procedures can be allowed to loop indefinitely, but it might make sense to let the music play until the loops begin to synchronise again – when the music might stop, or a new idea could be introduced. For example, in *Piano Phase* Reich adds a new note (A) when the loops cycle back into phase. Calculating the time that elapses before loops resynchronise is relatively straightforward when the difference in lengths is in whole beats. For audio samples, where the difference in lengths may be fractions of a second, the calculations are a little more complex. Is there potential here for some cross-curricular activity with the maths department?

Music for 18 Musicians

Minimalism comes of age

Reich's landmark work, *Music for 18 Musicians*, is considered by many to be his masterpiece. By 1976, Reich was finding the constraints of minimalism somewhat restricting. So he started expanding on the basic tenets of the minimalism by introducing some new features, including:

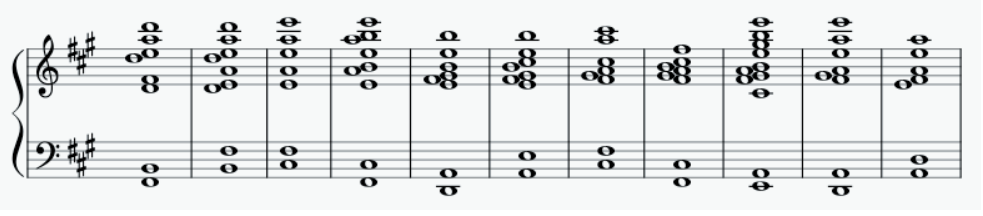
- **Harmonic progression:** prior to this point, most of Reich's pieces were built on a single harmony or a set of rhythmic procedures. The opening section of this new work comprises a progression of 11 pulsing chords that change gradually over the course of five minutes. Subsequent sections build on each of these chords in turn, before reprising on a variant of the opening section.
- **A 'human touch':** earlier pieces were mostly rigid in their construction, having an almost machine-like quality. Indeed, many could have been generated and performed electronically, and Reich has said that this was a perfectly acceptable and valid performance route. With *Music for 18 Musicians*, however, Reich introduces some chance or elasticity to the procedure. In the opening section, what determines how long each individual chord is held is linked to the length of time the bass clarinet player can sustain the repetitions of the bass note on a single breath. So players in the ensemble need to listen closely to their colleagues and take cues from each other. It's techniques such as this that allow ensembles playing his music to play without the need for a conductor.
- **Variety of instruments:** earlier pieces by Reich are usually written for single instruments or restricted percussion groups. With *Music for 18 Musicians*, he works with a greatly expanded range of instruments comprising violin, cello, clarinets and bass clarinets, women's voices, pianos, marimbas, xylophones and metallophone. Electronics are limited to microphones for voices and some instruments in order to obtain a balance in the overall sound.

Overview and analysis

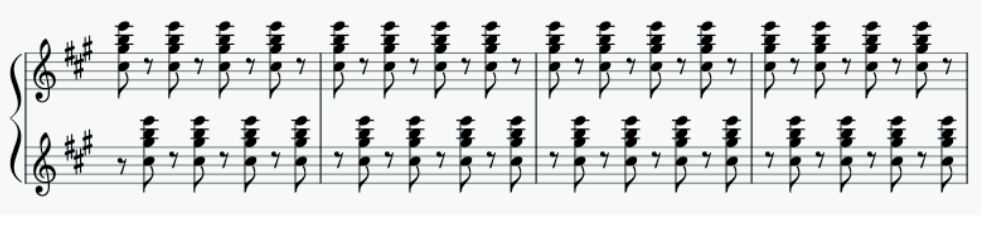
Music for 18 Musicians is a long and quite complex piece of music, so we will focus on just a few of its key features in this resource and the activity that follows:

The chords

The entire piece is built upon this series of chords:



Notice that they are not typical diatonic chords, nor do they follow conventional 'functional' progressions. The notes are shared between the ensemble players, with bass clarinet and cellos playing the bass clef parts, pianos playing the mid range and marimbas the higher notes. All instruments play pulsing quavers – on or off the beat. For example, the two pianos play this:



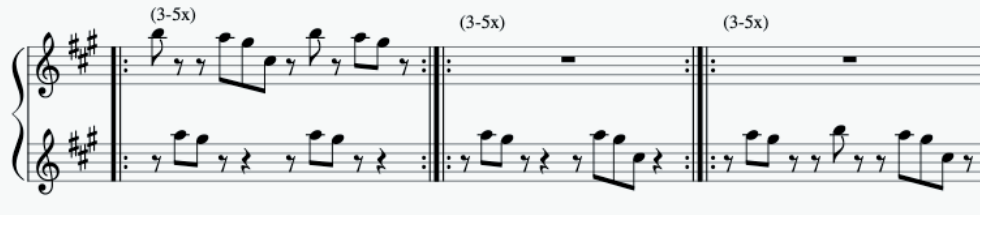
All players are instructed to play repetitions of patterns of different durations. Only approximate indications regarding numbers of repetitions are provided in the score. In the opening and closing 'pulse' sections, durations are determined by the breath patterns of the bass clarinet. They play their pulse pattern for two complete breaths before cueing the rest of the ensemble to move on.

The cues

In the other 11 sections, players take their cues from a distinctive five-note pattern played once by the bass metallophone – similar to the cues provided by bell players in West African drumming groups. This frees the individual players from having to slavishly count bars. They are free to play 'in the groove', giving a more relaxed, almost jazzy feel to the music.

Melodies and variations

Over this backdrop, the rest of the ensemble plays repeated melodic fragments where variation is provided by adding or taking away notes from the pattern over time. This, of course, also provides an element of rhythmic variation. Here is an extract of the xylophone parts from the middle of the piece:



Music for 18 Musicians: activity

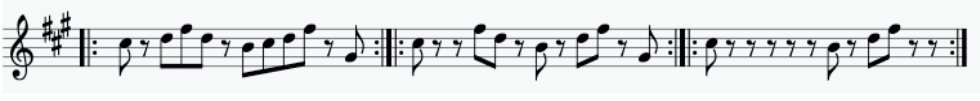
In this activity, students use *Music for 18 Musicians* as a model for original composition, working with musical features similar to those outlined above. This six-step 'template' approach to composition can help students organise musical ideas and devise a structure along the lines used by Reich in the work under discussion – albeit on a more modest level! This can be done as a solo or group composing exercise.

1 First, let's look more closely at the chords used by Reich. There is no real need to attempt to give names to these chords, since Reich does not think of them in terms of the usual progressions of functional harmony. Concentrate more on the note densities and spacings. Ask students the following questions (there some suggested answers provided in brackets):
- How many notes in the chords? (Between eight and 11.)
- Describe how Reich uses notes in the bass clef. (Pairs of notes in 4ths or 5ths, patterns rise and fall in a wave like motion.)
- Which pitches are used in this sequence? (All the pitches associated with the key signature of A major – with no accidentals.)
- What can you say about the notes of the chords in the treble clef? (There are no obvious patterns – dense textures comprising overlaying of triads, clusters and some wider spacings.)
- Say something about the range or tessitura of the notes in these chords. (A wide span from three octaves in the seventh chord, to just over four octaves in the tenth chord.)

2 Now that students have some understanding of this sequence of chords, they can devise a series of chords along similar lines:
- Decide on a key signature.
- Write a set of bass-clef chords, comprising pairs of notes in 4ths or 5ths – consider rising and falling patterns.
- For the treble clef, explore playing eight to ten notes (comprising clusters and wider spacings) over each bass note pair. Students can work in pairs so that all bass and treble clef notes can be sounded simultaneously on keyboards. Alternatively, notes can be entered into a midi sequence on computer.
- Aim for chords that sound satisfying and interesting when played in isolation – and in progression. Play them slowly so that there's time to savour and appraise the textures.

3 Allocate the notes from these chords to a group of players, or tracks on a sequencer. The bass-clef notes should be given to players of bass instruments to be played in steady quavers. The lower treble-clef notes should go to keyboard players playing on or off the beat as in the example shown above. Upper treble notes can be played on other instruments – again as a series of steady quavers, either on or off the beat.

4 Now work on melodic fragments and developments to be played over the top of this backing. Decide on a time signature, then work out some catchy phrases. Since they are to be repeated several times, it's important that they're rhythmically engaging. These phrases can then be gradually pared back by eliminating notes one by one – making sure that the rhythm patterns remain 'funky'. For example:



The playing order could also be reversed, so that notes are added incrementally after a specified number of repetitions.

5 A second series of melodic fragments can be developed that lock together with the first sequence. This could be a new set of notes and rhythms or a canon-like variation of the first set. Again, players should be allocated to play these more demanding lines.

6 A structure, similar to the one used by Reich, can now be devised, and a performing score produced. The number of repetitions for each section can be predetermined or cued by one or more ensemble players. Repetition of parts can easily lead to monotony. Guard against this by having some parts dropping out for some sections and making effective use of crescendos and/or diminuendos – a standard Reichian ploy.

Different Trains

Reich wrote *Different Trains* in 1988, after recalling cross-country train trips that he had taken as a child. When he was one year old, his parents separated, his mother moving to Los Angeles while Reich stayed with his father in New York. Between 1939 and 1942, Reich travelled frequently on trains back and forth between these two cities, accompanied by a governess. Many years later, Reich reflected that, as a Jew, had he been living in Europe at the same time, he might well have been travelling on very different trains.

This piece marks a new musical direction for Reich. Part documentary, part autobiography, this piece weaves layers of pre-recorded and live sounds that he would later develop further with his multimedia works. *Phase to Face –a Portrait of Steve Reich* (**www.vimeo.com/236560034**) is an excellent film that provides helpful context and performance footage for all the pieces mentioned in this resource. The section on *Different Trains* begins at 33:42, providing useful background material.

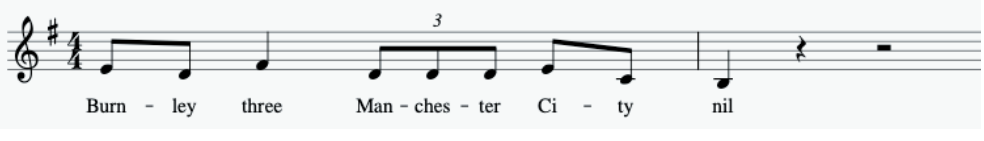
There are four distinct layers of sound in this piece:

1. Scoring for live string quartet.
2. Speech extracts: these comprise archive recordings from Reich's governess, reminiscing about their train trips together; a retired Pullman porter who used to ride the lines between New York and Los Angeles; and Holocaust survivors now living in America.
3. Recordings of European and American train sounds of the 1930s and 40s, including sirens and warning bells.
4. Pre-recorded string quartet parts.

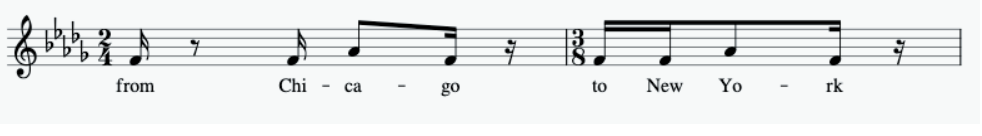
In his scoring for the live quartet strand of this piece, Reich builds on the ideas he was exploring with earlier works such as *It's Gonna Rain.* When we listen to this three-word phrase as a repeated loop, we start to hear the intonation of the syllables as specific pitches, enunciated in definite rhythm patterns. Indeed, there is music inherent in all forms of everyday speech – which becomes more noticeable when the speakers are being particularly expressive. So we hear it clearly when actors, preachers, politicians and poets are talking. But it is there in even more prosaic examples. Consider, for instance. a sports commentator reading out football results:

Burnley 3 – Manchester City 0

The voice usually rises on the winning score and dips for the losers. And the names of these teams will already have standard rhythms associated with them. So if we were to loop this phrase, we might hear something like this:



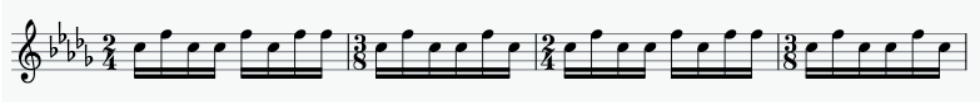
Reich does exactly this with some key phrases from the archive interview recordings. For example, from the first movement:



These phrases are played live by the various quartet players in juxtaposition with the speech extracts – triggered during performance using an electronic sampler.

It's worth noting that when Reich uses sound effects such as the train whistles, he is thinking carefully about their implied musical content, and uses the material in a way that makes a *musical* contribution to the piece. The American train whistles are long intervals of perfect 4ths and 5ths, while the European train whistles are mostly short triadic shrieks. Listen to the opening bars of the first movement of *Different Trains* to hear the American train whistles playing in time and in tune with the ensemble. Sometimes the string players even mimic these train sounds.

The pre-recorded string quartet parts are reminiscent of the three *Counterpoint* pieces by Reich that preceded this piece: *Vermont Counterpoint* for flutes, *New York Counterpoint* for clarinets and *Electric Counterpoint* for electric guitars. Three complete string quartet parts were recorded, providing 12 lines of music in total. Reich brings his background as a drummer to the writing of these parts, which are largely based on drumstick paradiddle rhythms – substituting alternating pitches for drum stick strokes:



This seminal work won the Grammy award for best classical contemporary composition in 1989. It provided a basic model for much subsequent work by Reich, and has been a major influence on both his contemporaries and a whole generation of younger composers.

Different Trains: activities

This activity is in the nature of a series of exercises, designed to allow students to extend their composition techniques....

Working with drum patterns

In *Different Trains*, Reich develops some highly effective and original accompaniment patterns for string players by taking a standard paradiddle drum pattern (right, left, right, right, then left, right, left, left) and assigning pitches to the left- and right-hand stick strokes – see the musical example above. Students could take standard percussion patterns from rock, Latin, African and other styles and assign pitches to the various percussion instruments chosen. This could be achieved using standard notation or a piano roll editor in a MIDI sequencer.

Speech to music

Students should record a short audio loop of someone speaking. This can be done live or extracted from an archive speech recording. It should be very short – just a few seconds. This audio file can be looped in a sequencer program or an audio editor such as Audacity for detailed listening.

First of all, students should listen for an underlying regular beat and tap along as it plays. They may need to tweak the loop length to produce a pattern that loops over an exact number of beats. They should then attempt to write down the rhythm for this pattern, using standard notation or a graphic pattern. Some students may need help with this.

Next, they should focus on the pitch of the vocal delivery. As they listen, series of pitches should begin to emerge. You can hear psychologist Diana Deutsch explain the phenomenon here (**http://deutsch.ucsd.edu/psychology/pages.php?i=212**). Finally, with the help of an instrument, they should try to determine the approximate pitches used in the clip. The melody that arises from this study can then be transferred as a musical motif to instruments for further development.

Working musically with sound effects

John Paynter once said that the new music is not so very different from the old – it's just that we have more sounds to play with. John Cage said something similar, suggesting that electronics would have an important part to play in creating and controlling new sounds, whether they be synthesised or 'found'/environmental sounds.

Steve Reich's work provides many examples, including some of the works under discussion in this resource. However, as we noted earlier, we need to think carefully how we employ these sounds in our compositions. They are likely to sound more effective if the rhythm and pitches of these sounds make a musical contribution to the piece.

Judicious editing of sounds, using standard procedures such as beat stretching and pitch transposition, is worth considering. Then think about how to add these sounds as musical layers using the same criteria as you would for standard instruments. What contribution do they make? How do they interact with the other musical layers? Think about volume levels and panning. Would adding some reverb help?

Conclusion

A study of Steve Reich's music gives not only a good grounding and understanding of the world of minimalism. It can also provide insights into some of the contemporary music procedures and composing devices that are an important element of GCSE/A level study. For instance, AQA's A level specification provides a handy vocabulary checklist for its AoS 7 – Art music since 1910 (**www.aqa.org.uk/subjects/music/as-and-a-level/music-7272/subject-content/appraising-music**).

In the table below, I have extracted from the AQA list the features that are particularly relevant to the work of Reich and a study of minimalism. The activities outlined above provide opportunities for students not only to use this vocabulary, but also work with these features in their own music making activities.

Harmony	▶ Non-functional harmony ▶ Cluster chords ▶ Static harmony
Tonality	▶ Tonal ambiguity ▶ Modality
Structure	▶ Cyclical structures ▶ Ostinato
Sonority (Timbre)	▶ Studio effects, eg reverb, Sampling
Texture	▶ Looping ▶ Layering ▶ Drones
Tempo, metre and rhythm	▶ Additive rhythms ▶ Metrical displacement ▶ Phasing ▶ Augmentation and diminution