

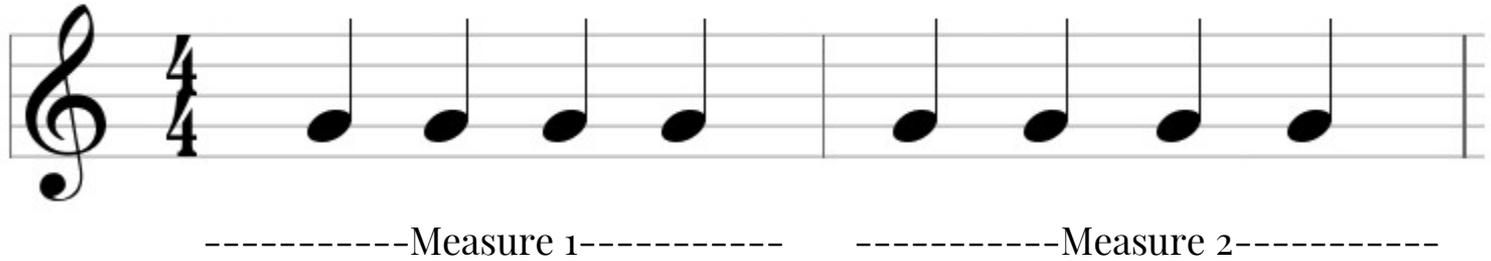
Music and Math

How to hear fractions!

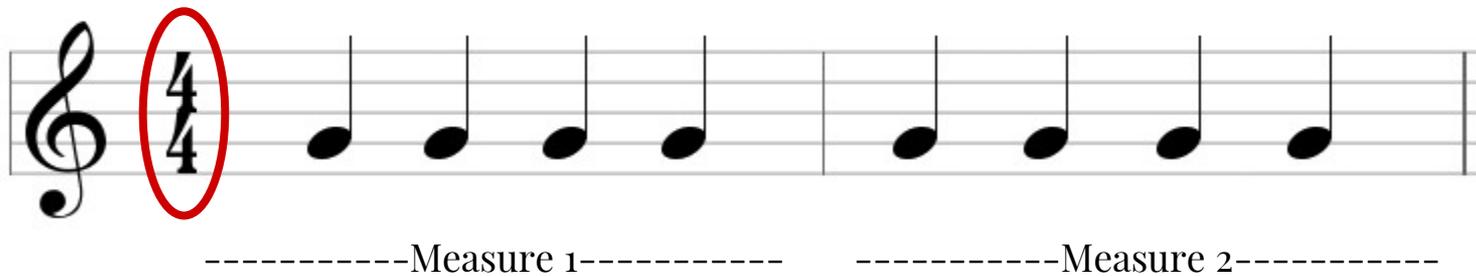
Basic Definitions

How Music can be Broken Down

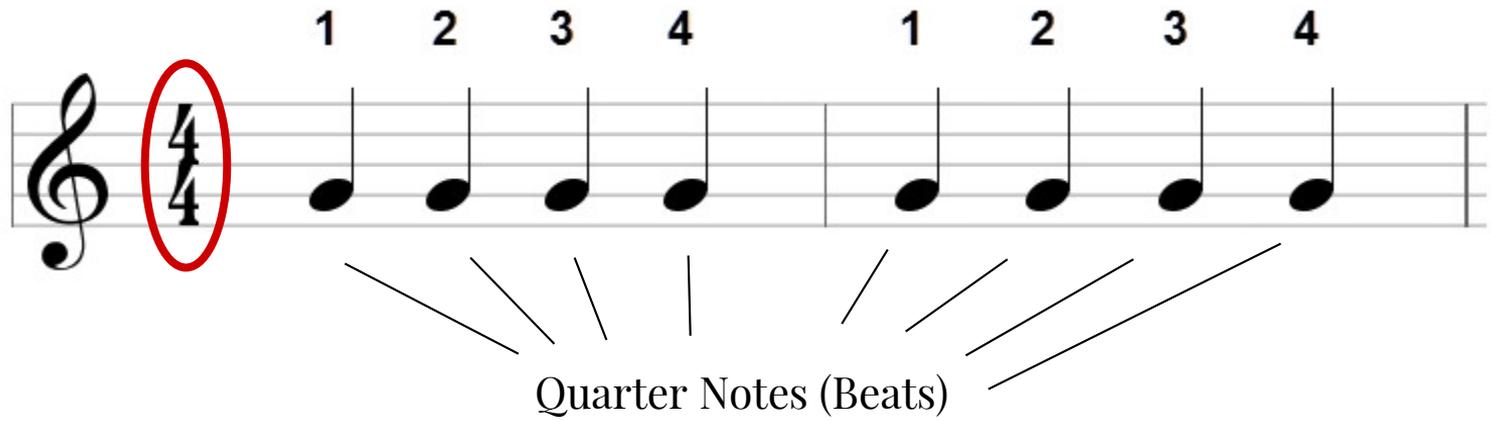
Intro	Verse(s)	Chorus	Verse(s)	Chorus	Bridge	Chorus	Outro
Introduces the song and draws in the listener	Tells part of the story	Main idea	Tells the story	Main idea	Adds variation and new ideas	Main idea	Wraps up the song and brings it to an end



How Quarter Notes Make up Measures



How Quarter Notes Make up Measures



How Quarter Notes Make up Measures



Video 1 Placeholder

Group Time!

- Get into groups of 3-4
- Each person picks 1 song
- See if all group members can feel the groove
- Count on your fingers or in your head!

Subdivisions



Whole Note



Quarter Note



Half Note



Eighth Note

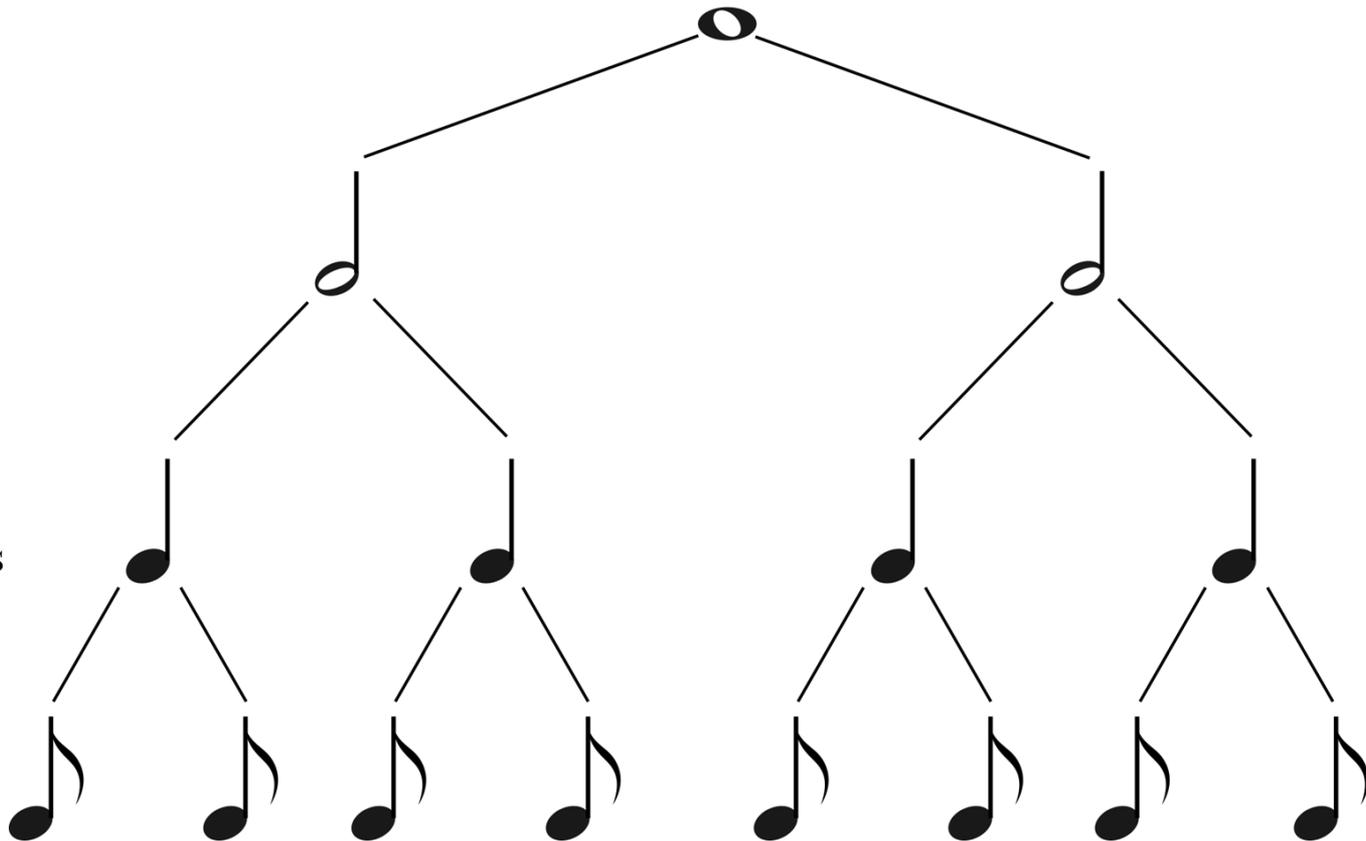
Names of Notes

Whole Note

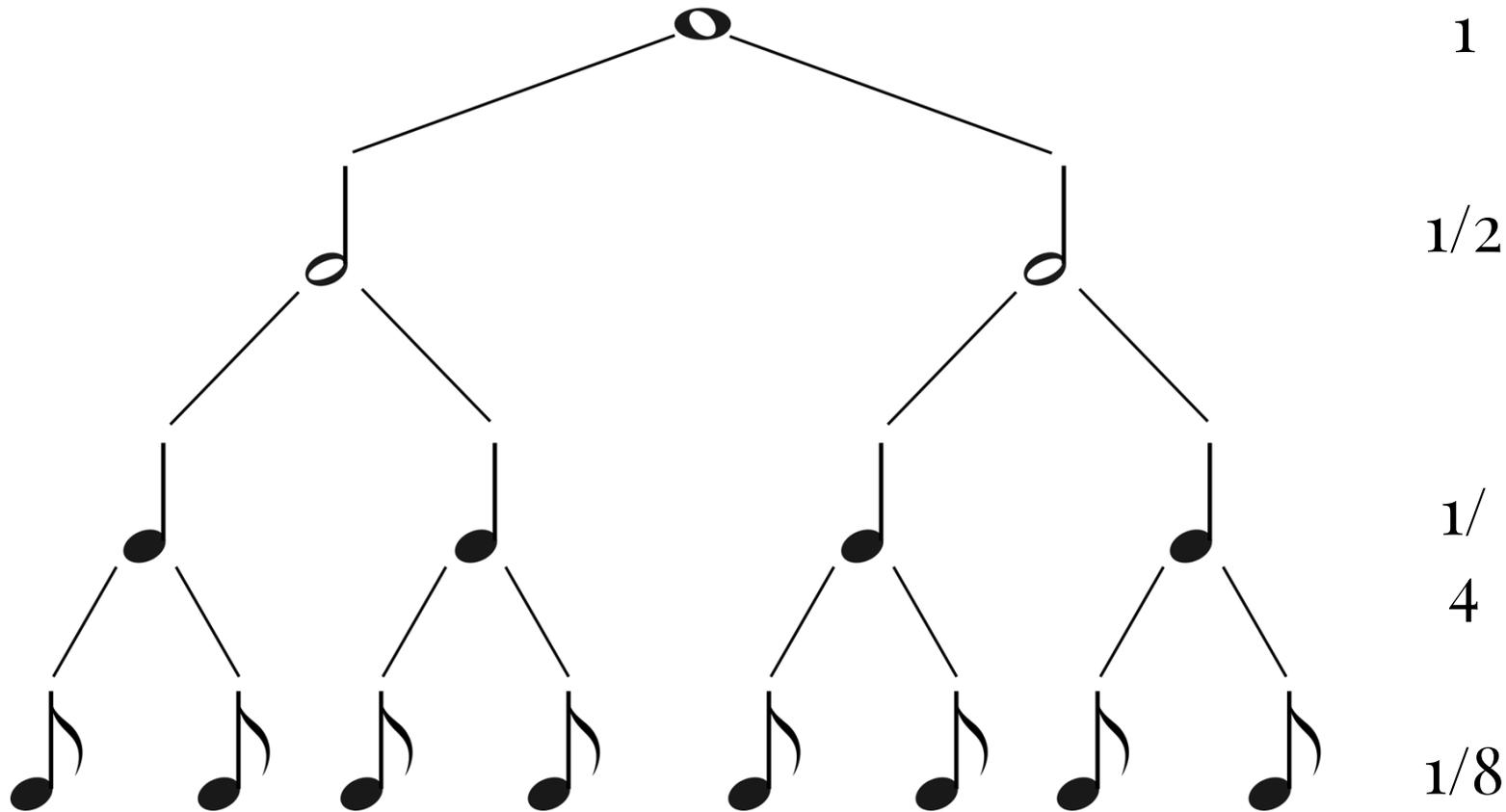
Half Notes

Quarter Notes

Eighth Notes



A Basic Look at Subdivisions



A Basic Look at Subdivisions (If a measure = 1)

A musical staff in 4/4 time with a treble clef. The first measure contains a whole note. The second measure contains two half notes. The time signature '4/4' is written at the beginning of the staff.

1 Whole Note 2 Half Notes

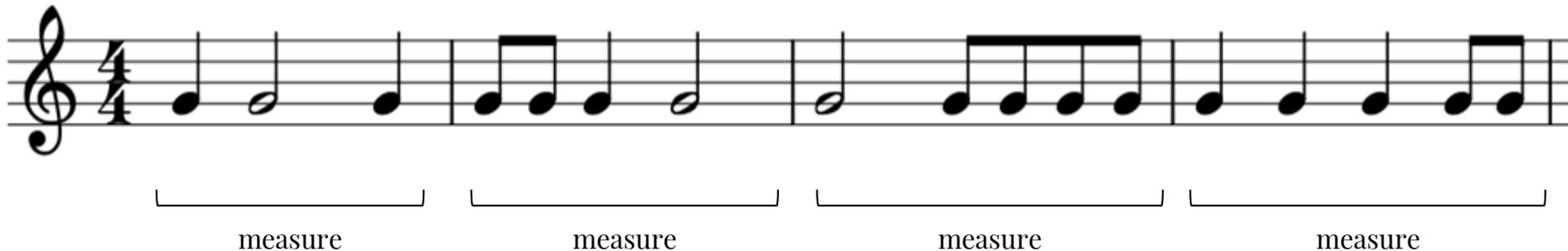
A musical staff in 4/4 time with a treble clef. The first measure contains four quarter notes. The second measure contains eight eighth notes. The time signature '4/4' is written at the beginning of the staff.

4 Quarter Notes 8 Eighth Notes

Four Examples of One Measure

More Ways to Make One Measure

- Think about how there's more than one way to make a dollar using coins
- There is also more than one way to make one measure using notes!



- Each of these are examples of one measure!

More Ways to Make One Measure

1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	2	4	8	8	4	2	2	8	8	8	8	4	4	4	8	8

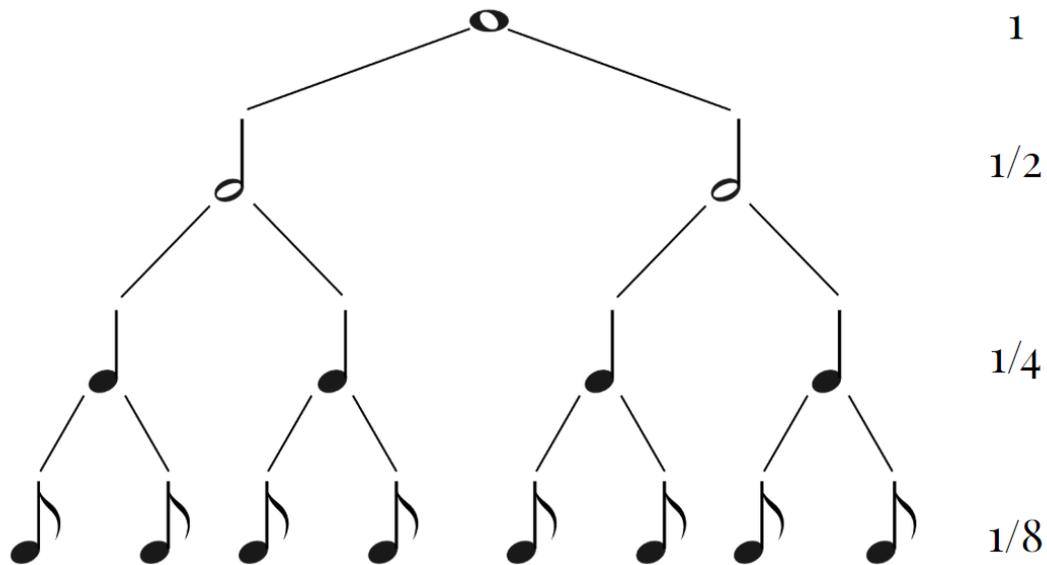


measure measure measure measure

- Here's a look at the fraction values that can be assigned to different rhythms
- Each of the measures sums to 1

You Try It!

- Use this graphic and make two unique examples of one measure



- If it helps, write out the fraction value above each note!

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Video 2 (Hearing Subdivisions in Music)

Triplets

Notes Can Be Divided in Thirds

- This is called a **Triplet**
- The most common triplet is when a quarter note is split into three parts
 - These are called eighth note triplets



Quarter Note



Eighth Note Triplets

Question

A quarter note is $\frac{1}{4}$ th of a measure. If an eighth note triplet is $\frac{1}{3}$ of a quarter note, what fraction of the measure is one eighth note triplet?

Answer

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Answer

$\frac{1}{12}$ th

Beat **2**
Triplet 1 2

Video 3 Placeholders (Examples of Triplets in Music)

Tempo

What is Tempo?

- Think of tempo as the “speed limit” of music
- Picture a road that has a speed limit of 35 miles per hour
- If a car drives at the speed limit for two hours, how many total miles did the car travel?

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Answer: 70 miles

What is Tempo?

- Instead of miles per hours (distance over time), the tempo of music is given as beats per minute
- For example, a song at 120 beats per minute (BPM), can fit 120 beats (quarter notes) in one minute
- Songs at higher BPMs feel faster! Faster songs can also feel more intense

J-Dilla - Don't Cry
71 BPM

Video 4 (Tempo Examples)

Tuplets

Advanced Rhythms

- If triplets split something into 3 parts, how many parts would result from quintuplets?

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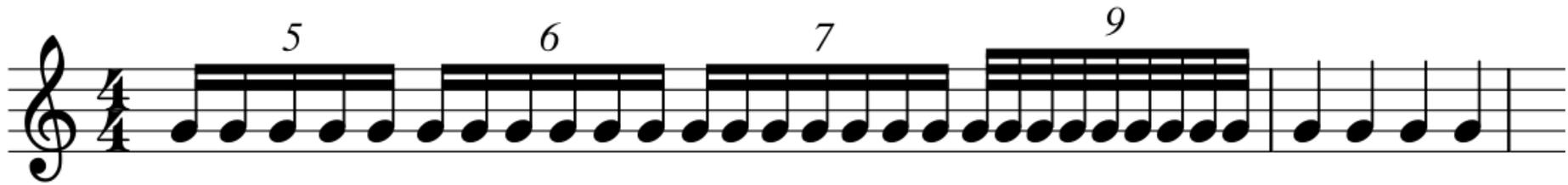
Answer: $1/20$

Tuplets

- Music can be subdivided into any fraction value imaginable
- We are limited only by our imaginations

List of Advanced Tuples

- Quintuplets (5 parts)
- Sextuplets (6 parts)
- Septuplets (7 parts)
- Nontuplet (9 parts)
- Note: Multiples of 4 were excluded



Notation Examples

A musical staff in 4/4 time, starting with a treble clef. The staff contains a sequence of notes: a group of 5 eighth notes, a group of 6 eighth notes, a group of 7 eighth notes, and a group of 9 eighth notes. Each group is indicated by a bracket underneath and a number above it. Following these groups are four quarter notes. Below the staff, the time signature 4/4 is written for each group of notes: $\frac{1}{4}$ for the 5-note group, $\frac{1}{4}$ for the 6-note group, $\frac{1}{4}$ for the 7-note group, $\frac{1}{4}$ for the 9-note group, and $\frac{1}{4}$ for each of the four quarter notes.

Notation Examples