Speaking in Tones

ACTIVITY OVERVIEW

Sound is an amazing medium for transmitting information. Just think of everything that we can transmit between people using spoken language. Then add into that everything that we understand and interpret from music. Even beeps have meanings. In this activity, we will explore how sound can convey meaning beyond words.

DIRECTIONS

For this activity, we will be working with a special tonal code to transmit information that can be interpreted as letters. Computers normally work in binary, but we are going to take things up to a higher level using the tones of Mandarin Chinese. There are four specific tones and a fifth neutral tone.

If we treat those five possible tones as each representing a number within a single bit of data, we are working in a base 5 system. Binary is base 2 (0 or 1) but in base 5 we can transmit 0, 1, 2, 3, or 4 by using the different tones. Therefore, within just two bits of data, we will be able to transmit 25 different codes. You will notice that in two cases, letters have been combined into a single code.

KEY				
0	**1**	**2**	**3**	**4**
Neutral Tone	High Tone	Rising Tone	Mid Tone	Falling Tone
a	**ā**	**á**	**ǎ**	**à**

00	**01**	**02**	**03**	**04**
SPACE	A	B	C	D
10	**11**	**12**	**13**	**14**
E	F	G	H	I
20	**21**	**22**	**23**	**24**
J	K	L	M	N
30	**31**	**32**	**33**	**34**
O	P	Q	R	S
40	**41**	**42**	**43**	**44**
T	U/V	W	Y	X/Z

So if we transmitted tonal 13, **ā ǎ**, it would mean the letter H. 13 would be transmitted as the high tone **ā**, followed by the mid or dipping tone **ǎ**.

Can you decode this phrase?

13 10 22 22 30 00 42 30 33 22 04

What about this?

aă ăa aà āà áà āá aa ăă ăa aă áā ăà

Now try writing your own code! See if a classmate can decode your message.

CONCLUDING THOUGHTS

If you have access to a sound recorder—on your computer, a phone, or whatever—try recording a code for someone to unlock using the different sounds.