

BRAIN BUILDING BEATS

# The Listening & Rhythm Progression

Prenatal to age seven

A practical, evidence-informed timeline for building toward steady beat, syncopation, pitch discrimination, and melodic memory through short everyday games.

**BEAT** > **PATTERN** > **OFF-BEAT** + **PITCH**

*Development varies widely. Research observations, caregiver observations, and practice ideas are labeled separately. This guide is not a milestone checklist or screening tool, and musical learning continues after age seven.*

## How to use this guide

**FOLLOW THE CHILD** Choose the stage that matches the child's current response, even if it differs from chronological age.

**KEEP IT SHORT** For babies and toddlers, one to three minutes is plenty. Preschoolers may enjoy five to ten minutes.

**MODEL FIRST** Young children synchronize better with a responsive person than with a device alone. Join the activity.

**ONE CHALLENGE** Change tempo, pattern, or pitch - only one at a time. Return to an easier layer when timing becomes unstable.

**NO PASS / FAIL** Interest, anticipation, and imitation are meaningful. Precision emerges gradually and varies between children.

## What each label means

**RHYTHM / PITCH** A concise synthesis of capabilities observed in group-level research. It is not a promise about an individual child.

**YOU MAY NOTICE** A variable caregiver observation, not a developmental milestone.

**TRY THIS** An evidence-informed activity to explore together, not a validated intervention or assessment.

## The two developmental tracks

| RHYTHM > SYNCOPATION                                                                                                                           | PITCH > MELODY                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| detect change > move to music > match a shared beat<br>> hold time through a rest > place sounds between<br>beats > coordinate rhythmic layers | detect pitch change > follow contour > label high/low/<br>same > compare smaller differences > echo short<br>melodies > hear tonal relationships |

**Safe listening** Keep sound comfortable and take breaks. For children, WHO's personal-audio standard uses 75 dB for 40 hours per week as a reference exposure; ordinary practice can stay much quieter. Avoid headphones for babies. Seek professional advice for concerns about hearing, speech, or development.

## The progression at a glance

Move down the timeline by observable readiness, not by pressure to reach the next age band.

|                         |                                                     |
|-------------------------|-----------------------------------------------------|
| ABOUT 24 WEEKS TO BIRTH | Prenatal: Familiar rhythm, not formal training      |
| 0 TO 6 MONTHS           | Newborn: Detecting change                           |
| 6 TO 12 MONTHS          | Explorer: Feeling meter and contour                 |
| 12 TO 24 MONTHS         | Mover: Movement begins to answer music              |
| 2 TO 3 YEARS            | Partner: Short moments of shared timing             |
| 3 TO 4 YEARS            | Pattern finder: Matching short patterns             |
| 4 TO 5 YEARS            | Beat keeper: Steady beat; introduce off-beat play   |
| 5 TO 6 YEARS            | Rhythm builder: Practice holding time through rests |
| 6 TO 7 YEARS            | Independent player: Explore coordinating layers     |

STAGE 1 OF 9 / ABOUT 24 WEEKS TO BIRTH

# Prenatal

## Familiar rhythm, not formal training

**RHYTHM** The developing auditory system begins responding to sound during the second half of pregnancy. The mother's voice, movement, breathing, and ordinary environmental rhythms already provide rich input.

**PITCH** Prosody and melody reach the fetus as filtered sound patterns, and late-pregnancy exposure can support later familiarity with a specific sound pattern. There is no need to amplify music or test a fetal response.

**YOU MAY NOTICE** No performance cue is expected. A change in movement during a familiar song is not a test of musical ability.

### TRY THIS

|               |                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------|
| Voice + pulse | Sing the same short lullaby at a comfortable speaking volume while gently tapping the pulse on your own thigh.   |
| Contour       | Use an easy rising-and-falling hum. Keep it natural, brief, and comfortable for the pregnant parent.             |
| Safety        | Never place headphones or a speaker directly on the abdomen. Avoid very loud or strongly vibrating environments. |

**READINESS CUE** *The goal is familiarity and connection, not measurable synchronization.*

**EVIDENCE BASE** [CDC/NIOSH \(2023\)](#) / [Partanen et al. \(2013\)](#)

## STAGE 2 OF 9 / 0 TO 6 MONTHS

# Newborn

## Detecting change

**RHYTHM** Newborn brains can register a missing beat in a repeating pattern. Infants may alter gaze, sucking, or movement when timing changes, but they are not expected to keep time.

**PITCH** Young infants respond to pitch changes and melodic contour. By a few months, many recognize familiar melodies and attend strongly to expressive infant-directed singing.

**YOU MAY NOTICE** Stillness, widened eyes, a head turn, a smile, or a change in kicking when a sound changes.

### TRY THIS

|                |                                                                                                              |
|----------------|--------------------------------------------------------------------------------------------------------------|
| Four and pause | Sing or speak four evenly spaced syllables, pause, then repeat: ta - ta - ta - ta.                           |
| High / low     | Alternate one comfortable high hum and one low hum. Let the baby watch your face.                            |
| Familiar song  | Repeat one short song during a calm routine. Stop if the baby turns away, fusses, or becomes overstimulated. |

**READINESS CUE** *Attention to a change matters more than a visible movement on the beat.*

**EVIDENCE BASE** [Winkler et al. \(2009\)](#) / [Lau, Oxenham & Werner \(2021\)](#)

STAGE 3 OF 9 / 6 TO 12 MONTHS

# Explorer

## Feeling meter and contour

**RHYTHM** Infants can notice rhythmic-pattern differences and may move more when music speeds up. They remain flexible listeners across meters that are unfamiliar to adults. Movement is responsive, not precisely synchronized.

**PITCH** Pitch contour becomes especially useful: up, down, and repeating shapes are easier to notice than small interval differences.

**YOU MAY NOTICE** Anticipation during a familiar song, bouncing or arm movement, and renewed attention when a pattern changes.

TRY THIS

|                  |                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------|
| Supported bounce | With the baby securely supported, bounce gently to a steady song, then stop for one beat and resume.     |
| Two meters       | On different days, sing a simple pattern grouped in two and another grouped in three. Keep both playful. |
| Follow the voice | Hum a slow glide upward and downward while tracing the direction with your hand.                         |

**READINESS CUE** *Look for participation and anticipation, not accurate imitation.*

**EVIDENCE BASE** [Zentner & Eerola \(2010\)](#) / [Phillips-Silver & Trainor \(2005\)](#)

## STAGE 4 OF 9 / 12 TO 24 MONTHS

# Mover

## Movement begins to answer music

**RHYTHM** Spontaneous movement to music becomes easier to see. Early tempo adjustment may appear during the second year, although movement often drifts away from the beat.

**PITCH** Voice-and-gesture games can introduce broad pitch directions. Accurate note matching or reliable verbal labels are not expected.

**YOU MAY NOTICE** Swaying, bouncing, clapping bursts, stop-go anticipation, or an attempted vocal response.

### TRY THIS

|                |                                                                                                            |
|----------------|------------------------------------------------------------------------------------------------------------|
| Stop / go      | Move together while a song plays. Pause the song and freeze; restart and move again.                       |
| Copy one       | Make one drum sound or clap and wait. Celebrate any deliberate attempt to answer.                          |
| Voice elevator | Move a toy upward with a rising hum and downward with a falling hum; invite the child to copy either part. |

**READINESS CUE** *A deliberate response is meaningful; precision can come later.*

**EVIDENCE BASE** [Zentner & Eerola \(2010\)](#) / [Yu & Myowa \(2021\)](#)

STAGE 5 OF 9 / 2 TO 3 YEARS

# Partner

## Short moments of shared timing

**RHYTHM** Children may briefly align drumming or tapping with a partner when the beat is close to their own naturally fast tempo. Social music-making often supports better timing than a machine alone.

**PITCH** Large pitch contrasts and simple contour gestures can be introduced as play. Reliable explicit higher/lower or same/different judgments are not expected at a fixed age.

**YOU MAY NOTICE** Two or three taps that briefly line up, imitation of one short sound, or an emerging high/low gesture.

TRY THIS

|                   |                                                                                                                                               |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Drum together     | Face each other and drum at the child's comfortable speed. Match the child first, then invite four shared beats.                              |
| Ta / ta-ka        | Speak one beat as ta, then split it into ta-ka. Let the child choose which one to echo.                                                       |
| Big pitch gesture | Sing one clearly rising or falling glide and trace it with your hand. Invite the child to copy the gesture; naming the direction is optional. |

**READINESS CUE** *Keep patterns to one or two beats and end while the child still wants another turn.*

**EVIDENCE BASE** [Kirschner & Tomasello \(2009\)](#) / [Yu & Myowa \(2021\)](#)



## STAGE 6 OF 9 / 3 TO 4 YEARS

# Pattern finder

## Matching short patterns

**RHYTHM** Beat matching improves but usually works within a narrow tempo range. Short rhythm reproduction and missing-beat games are more realistic than long metronome tasks.

**PITCH** Pitch discrimination improves substantially across the preschool years. Many children can sort high, low, same, and different when contrasts are clear.

**YOU MAY NOTICE** An attempted short rhythm echo, renewed attention when a beat is omitted, or increasingly consistent high/low sorting with large contrasts.

### TRY THIS

|                |                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Short echo     | Clap one or two easy sounds and let the child answer. Add another sound only when the shorter echo is comfortable.                        |
| Notice the gap | Tap four steady beats but silently show one with your hand. Invite the child to point, move, or make a sound when the quiet beat returns. |
| Pitch sorting  | Use two or three objects as high, middle, and low. Match each object to a sung or played note.                                            |

**READINESS CUE** *Introduce the space between beats only after the steady beat feels comfortable.*

**EVIDENCE BASE** [Abramson & Lloyd \(2016\)](#) / [Drake, Jones & Baruch \(2000\)](#)

## STAGE 7 OF 9 / 4 TO 5 YEARS

# Beat keeper

Steady beat; introduce off-beat play

**RHYTHM** Some children can now maintain a steady beat and reproduce simple rhythms, though the workable tempo range remains limited. Off-beat awareness can be introduced as a partner game rather than expected as a milestone.

**PITCH** Three-note contours and smaller same-versus-different contrasts become useful. Singing may preserve contour before exact pitch.

**YOU MAY NOTICE** A short run of reasonably steady taps, an attempted copied rest, or growing comfort continuing after a pause.

## TRY THIS

|                |                                                                                                     |
|----------------|-----------------------------------------------------------------------------------------------------|
| Beat / between | Adult taps a slow steady beat; child claps halfway between. Say 'beat - and - beat - and' together. |
| Rest pattern   | Echo ta - ta - rest - ta. Keep a silent hand motion during the rest so time continues.              |
| Three-note map | Sing three notes that go up, down, or stay level. The child draws or points to the matching shape.  |

**READINESS CUE** *Off-beat success should feel like a shared game, not a timing exam.*

**EVIDENCE BASE** [Drake, Jones & Baruch \(2000\)](#) / [McAuley et al. \(2006\)](#)

## STAGE 8 OF 9 / 5 TO 6 YEARS

# Rhythm builder

## Practice holding time through rests

**RHYTHM** Steady-beat accuracy and tempo flexibility continue improving. Children can begin separating beat keeping, pattern memory, and feedback-assisted clapping as distinct skills; syncopation can be introduced as a separate challenge.

**PITCH** Tonal expectations strengthen with experience. Short sung patterns within a comfortable vocal range are more useful than demanding exact labels.

**YOU MAY NOTICE** A beat that survives a short pause, a copied simple rhythm, or a three-note vocal answer with the correct direction.

### TRY THIS

|                            |                                                                                                        |
|----------------------------|--------------------------------------------------------------------------------------------------------|
| <b>Silent continuation</b> | Tap eight beats together, stop making sound for four beats while moving silently, then rejoin.         |
| <b>Off-beat ladder</b>     | Begin with one off-beat clap per bar, then two. Return to the steady beat whenever timing falls apart. |
| <b>Three-note answer</b>   | Sing a small three-note pattern and invite an echo. Score the shape first, then closeness of pitch.    |

**READINESS CUE** *Train one variable at a time: tempo, pattern, or pitch - not all three together.*

**EVIDENCE BASE** [Bonacina et al. \(2019\)](#) / [Drake \(1993\)](#)

STAGE 9 OF 9 / 6 TO 7 YEARS

# Independent player

## Explore coordinating layers

**RHYTHM** Synchronization for simple beats often becomes more stable around this period, while rhythm memory and full-body timing continue developing. Children can practice alternating roles and coordinating beat, rest, and off-beat patterns.

**PITCH** Pitch discrimination is more reliable than in early preschool, but fine thresholds continue maturing beyond age seven. Short melodic memory and stepwise pitch comparisons are appropriate.

**YOU MAY NOTICE** Maintaining a simple beat briefly without the model, attempting to switch rhythmic roles, or reproducing a short contour.

### TRY THIS

|                    |                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Syncopation ladder | Play four levels: all beats; beats plus 'and'; rests on selected beats; accented off-beats. Master one before adding the next. |
| Switch roles       | Child keeps the beat while the adult syncopates, then swap. Listening while holding a different layer is the challenge.        |
| Pitch steps        | Compare same, one step up, and one step down. Add a four-note echo only when the three choices are reliable.                   |

**READINESS CUE** Age seven is a waypoint, not a closing gate. Keep adapting challenge to the individual child.

**EVIDENCE BASE** [Bonacina et al. \(2019\)](#) / [Rose et al. \(2018\)](#)

## A four-layer practice ladder

This is a teaching sequence, not a set of age-based milestones. Use the same short pattern across four layers. Stay at a layer until the child is relaxed and successful, then add only one new demand.

|   | Layer | What changes                                                 | Sound map     |
|---|-------|--------------------------------------------------------------|---------------|
| 1 | Feel  | Adult models the pulse; child listens or moves.              | ta ta ta ta   |
| 2 | Join  | Child taps the same steady beat with the adult.              | TA TA TA TA   |
| 3 | Hold  | One sound becomes a rest while the pulse continues silently. | TA - TA TA    |
| 4 | Shift | A sound moves between two beats; adult keeps the anchor.     | TA +ta TA +ta |

### When to step back

**TIMING BREAKS** Return to the steady beat and match the child's natural tempo.

**PITCH GUESSING** Make the contrast larger or return to up/down contour gestures.

**FRUSTRATION** End with an easy success. Repetition across days matters more than finishing a level.

### A note about age seven

Research describes early childhood as a sensitive period in which experience may have unusually strong effects. That is not the same as a hard closing date. Auditory, rhythmic, and musical learning continue beyond age seven and across the lifespan.

## Research notes and sources

This guide synthesizes group-level studies that used different ages, tasks, and methods; no single study validates the complete prenatal-to-seven sequence. Ages are deliberately broad, and the activities are educational rather than diagnostic, therapeutic, or validated developmental assessments. Reviews provide orientation; primary studies support the specific age pages linked above.

**Provasi, Anderson & Barbu-Roth (2014).** Rhythm perception, production, and synchronization during the perinatal period. [Source](#)

**Winkler et al. (2009).** Newborn infants detect the beat in music. [Source](#)

**Zentner & Eerola (2010).** Rhythmic engagement with music in infancy. [Source](#)

**Bonacina et al. (2021).** Rhythm, reading, and sound processing in the brain in preschool children. [Source](#)

**Bonacina et al. (2019).** How rhythmic skills relate and develop in school-age children. [Source](#)

**Frischen, Degé & Schwarzer (2022).** The relation between rhythm processing and cognitive abilities during child development: The role of prediction. [Source](#)

**Abramson & Lloyd (2016).** Pitch discrimination screening in children ages 3-5. [Source](#)

**Lau et al. (2021).** Infant pitch and timbre discrimination. [Source](#)

**Nguyen, Flaten, Trainor & Novembre (2023).** Early social communication through music: State of the art and future perspectives. [Source](#)

**Merrett, Peretz & Wilson (2013).** Moderating variables in music-training neuroplasticity. [Source](#)

**CDC/NIOSH (2023).** Noise and reproductive health. [Source](#)

**WHO-ITU (2019).** Safe listening devices and systems standard. [Source](#)

**Partanen et al. (2013).** Prenatal music exposure induces long-term neural effects. [Source](#)

**Phillips-Silver & Trainor (2005).** Feeling the beat: Movement influences infant rhythm perception. [Source](#)

**Yu & Myowa (2021).** The early development of tempo adjustment and synchronization during joint drumming. [Source](#)

**Kirschner & Tomasello (2009).** Joint drumming: Social context facilitates synchronization in preschool children. [Source](#)

**Drake, Jones & Baruch (2000).** The development of rhythmic attending in auditory sequences. [Source](#)

**McAuley et al. (2006).** The time of our lives: Life span development of timing and event tracking. [Source](#)

**Drake (1993).** Reproduction of musical rhythms by children, adult musicians, and adult nonmusicians. [Source](#)

**Rose et al. (2018).** Pure-tone frequency discrimination in preschoolers, young school-age children, and adults. [Source](#)

## Care and safety

Keep listening at a comfortable conversational level, avoid prolonged loud sound, and stop when a child signals discomfort. Do not place sound devices on a pregnant abdomen. If a child does not respond to sound, loses an existing skill, or you have concerns about hearing, speech, or development, contact the child's clinician or a qualified audiologist.

**Listen. Move. Answer. Build the next layer.**