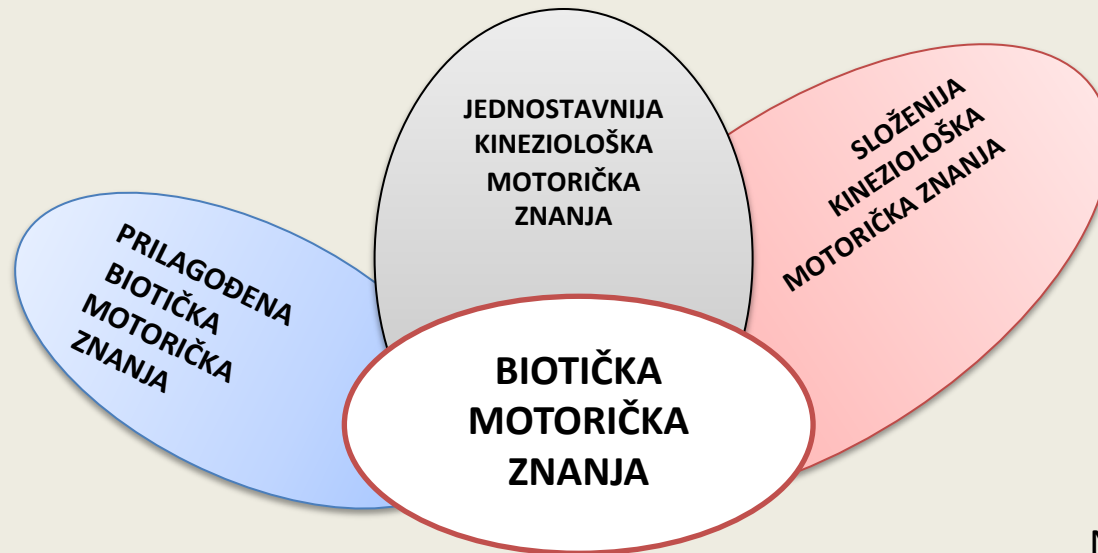


**Važnost razvoja  
biotičkih motoričkih  
znanja kod djece  
predškolske dobi**



# BIOTIČKA MOTORIČKA ZNANJA SU ISHODIŠTE NA KOJE SE NADOGRAĐUJU SVA OSTALA MOTORIČKA ZNANJA



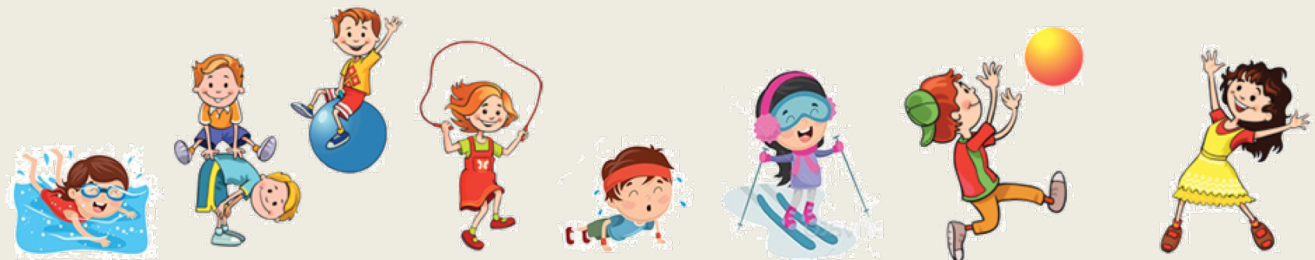
Neljak, 2009.

- Biotička motorička znanja (BMZ) su vještine koje omogućavaju djeci interakciju i istraživanje svoje okoline (Gallahue i sur., 2002).
- Ovakvi oblici motoričkih aktivnosti se smatraju **temeljnim i nezaobilaznim dijelom u stvaranju većine sposobnosti i osobina čovjeka tijekom razvoja.**
- **Ove kretne strukture čine čvrstu osnovu i najbolju pripremu za izgradnju više naprednih i složenijih motoričkih znanja** (Gallahue i sur., 2003; Payne i sur., 2002).

# MOTORIČKO UČENJE

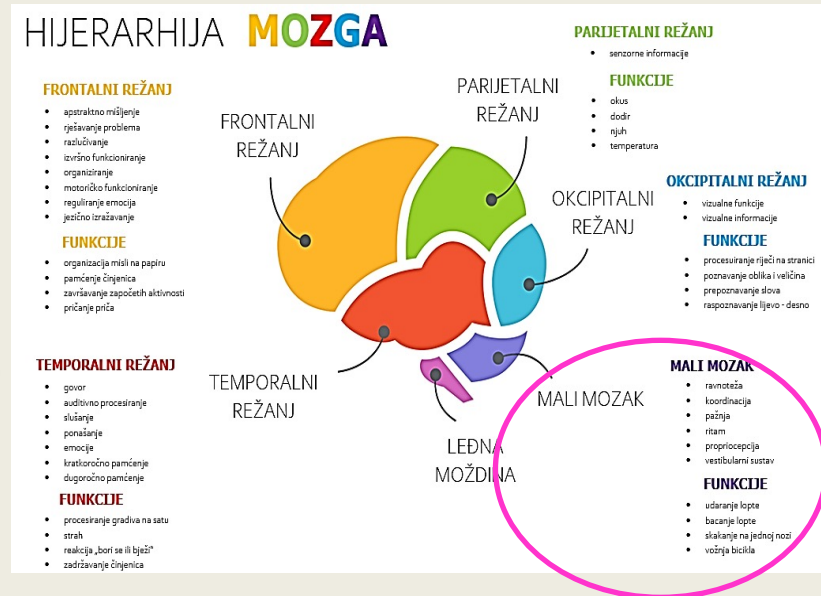
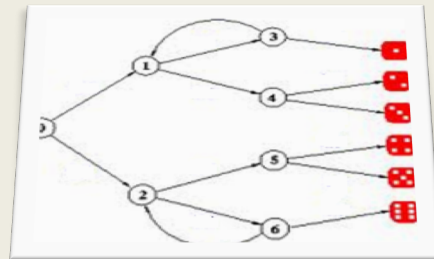
Schmidt i Lee (2005:320\*) motoričko su učenje definirali kao skup unutarnjih procesa povezanih s vježbanjem i iskustvom koje vode **PREMA RELATIVNO TRAJNIM PROMJENAMA** u sposobnostima pojedinca pri izvođenju motoričkog zadatka.

Edwards (2010) je definirao motoričko učenje kao proces u kojem se mijenja sposobnost izvedbe motoričkog znanja, a kao rezultat **poduke, vježbanja ili iskustva** te **utjecaja** kojeg **učenik, znanje koje se uči i okolina** imaju na taj proces



# ZAJEDNIČKO SVIM TEORIJAMA MOTORIČKOG UČENJA

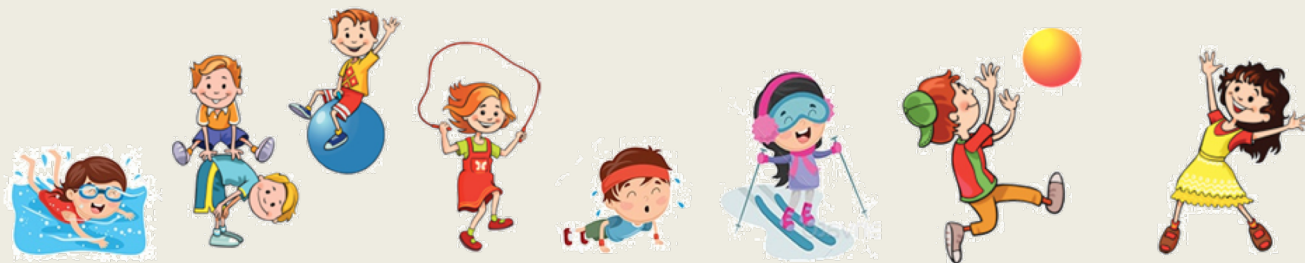
- 4 OSNOVNE KARAKTERISTIKE PROCESA MOTORIČKOG UČENJA:
  1. MOTORIČKO UČENJE JE PROCES
  2. MOTORIČKO UČENJE JE IZRAVNI REZULTAT VJEŽBANJA ILI ISKUSTVA
  3. MOTORIČKO UČENJE NIJE VIDLJIVO DIREKTNO



4. UZROKUJE RELATIVNO TRAJNE PROMJENE U KAPACITETIMA NAUČENIH PONAŠANJA

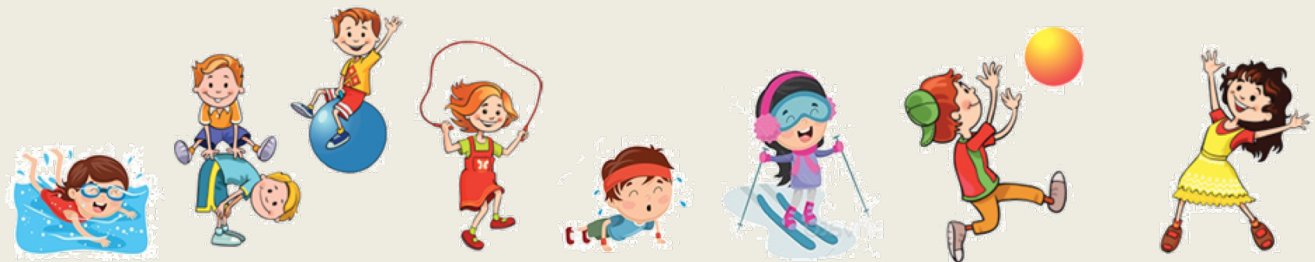


**Postojanje motoričkih programa / motoričkih znanja/  
motoričkih informacija omogućava ostvarivanje  
svrhovitih motoričkih struktura gibanja, odnosno  
aktiviranje i deaktiviranje različitih mišićnih skupina s  
obzirom na redoslijed, intenzitet i trajanje nekoga rada,  
što rezultira izvođenjem određene motoričke  
operacije**



# ZAJEDNIČKO SVIM TEORIJAMA MOTORIČKOG UČENJA

1. **LJUDI SE NE RAĐAJU S MOTORIČKIM ZNANJIMA**
2. **RANE FAZE UČENJA OKARAKTERIZIRANE SU POKUŠAJIMA ONIH KOJI UČE DA SE STVORI PREDODŽBA O POKRETU:** *kognitivna faza učenja (Fitts and Posner, 1967); verbalno-kognitivna faza učenja (Adams, 1971.); stvaranje predodžbe o pokretu (Gentile, 1972); stvaranje koordinacije pokreta (Newell, 1985)*
3. **S VREMENOM ZAPOČINJU PROCESI OTKLANJANJA POGREŠAKA U IZVEDBI:** *asocijativna faza učenja (Fitts and Posner, 1967)*
4. **ZAVRŠNA FAZA PROCESA UČENJA POSTIŽE SE, **ALI NE UVIJEK**, NAKON DUGOTRAJNOG PROCESA UČENJA/VJEŽBANJA:** *autonomna faza učenja (Fitts and Posner, 1967); motorička faza učenja (Adams, 1971); fiksacija znanja (Gentile, 1972); kontrolirana faza izvođenja pokreta (Newell, 1985)*



# KONTINUUM RAZVOJA MOTORIČKIH ZNANJA

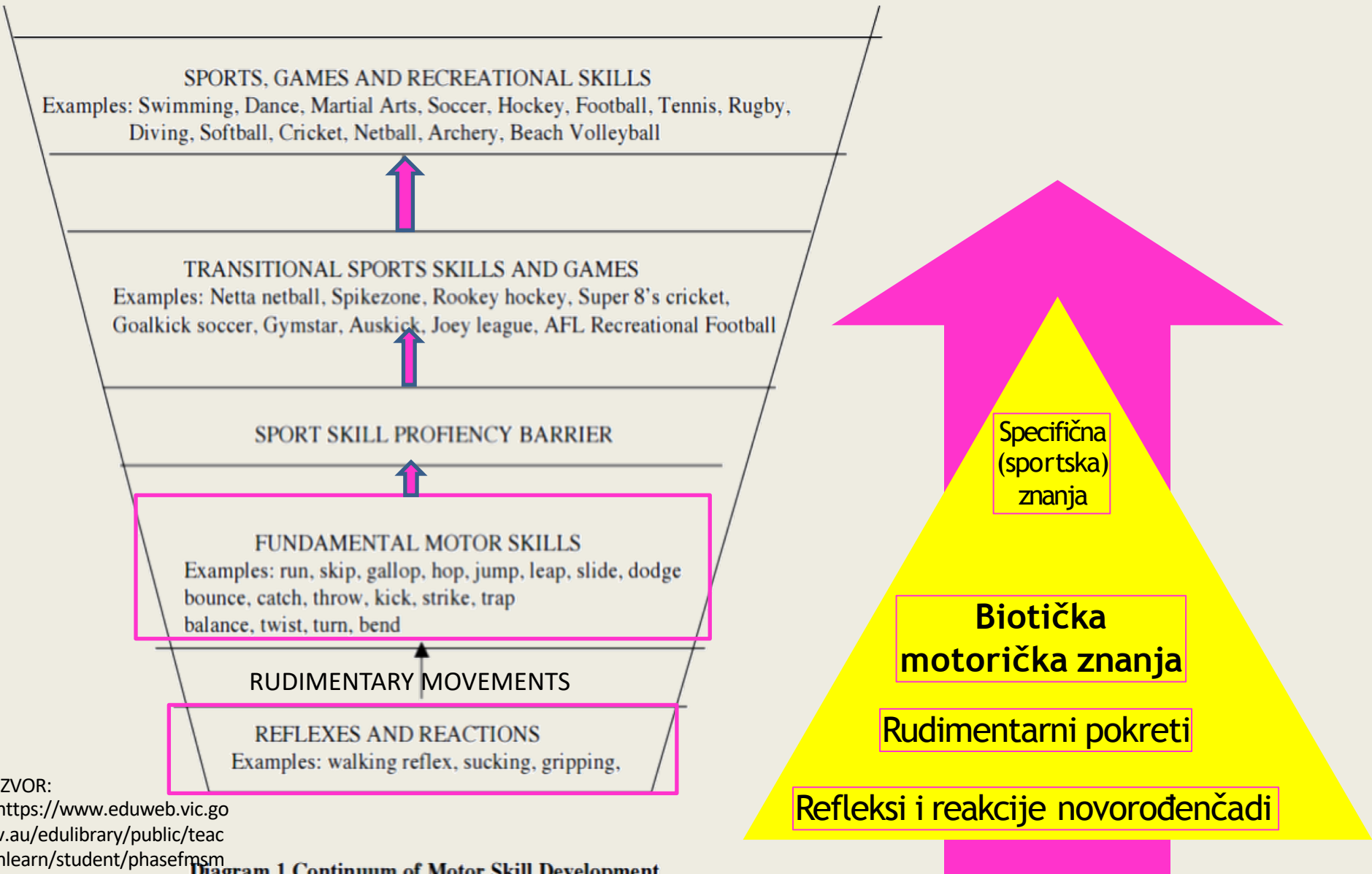
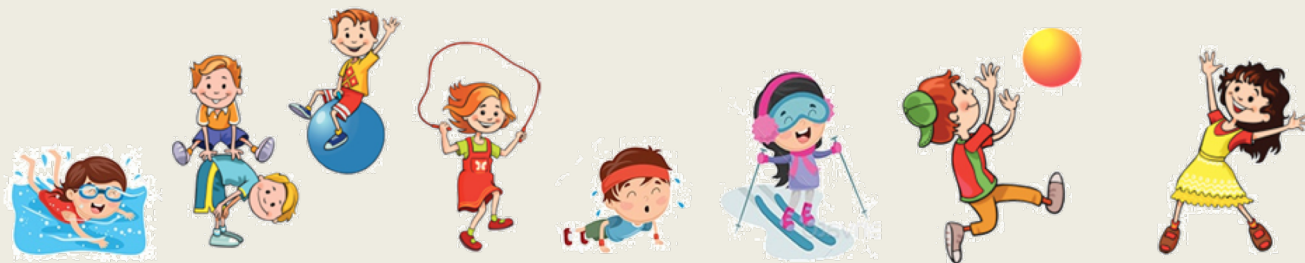


Diagram 1 Continuum of Motor Skill Development

IZVOR:  
<https://www.eduweb.vic.gov.au/edulibrary/public/teachlearn/student/phasefmsmod.pdf>

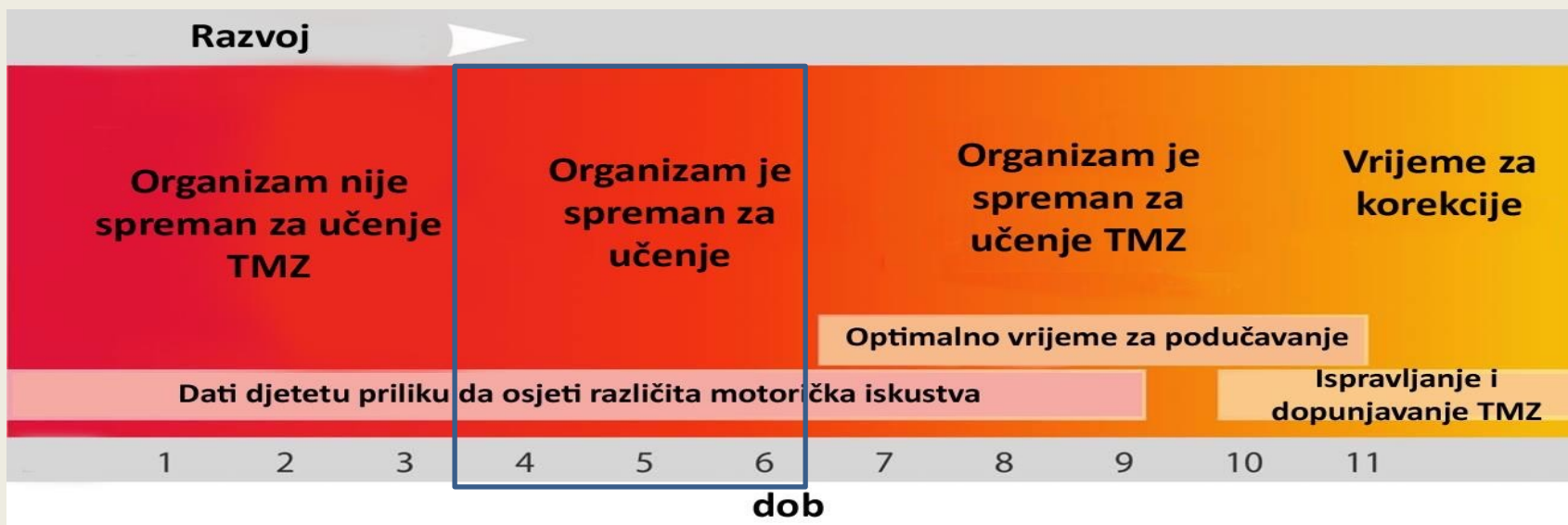
# UČENJE BIOTIČKIH MOTORIČKIH ZNANJA

- Djeca ispravke svojih izvedbi biotičkih motoričkih znanja ne mogu naučiti kroz normalni rast i razvoj (Gallahue i sur., 2003).
  - Zabluda je da djeca „prirodno”, sama od sebe, nauče kako trčati, bacati, skakati i hvatati (Payne & Isaacs, 2005; Clark, 2005)
  - Slobodna igra ne potiče razvoj prirodnih oblika kretanja (Gagen i Getchell, 2006).
- Djecu treba podučiti kako ispraviti izvedbe svojih biotičkih znanja i dati im mogućnost da ta ista znanja upotrebljavaju u stvarnim situacijama dok ne postanu vješti u njihovim izvedbama (Robinson & Goodway, 2009).



# U kojoj životnoj dobi treba započeti s učenjem BMZ?

- Vallentyne (2002) navodi kako je najbolje razdoblje za razvoj BMZ do 8 godine života.
- Većina drugih autora navodi kako je najbolje razdoblje za motorički razvoj vrijeme od 7 do 12 godine. Smatraju da su u ovom periodu djeca visoko intrinzično motivirana i prirodno entuzijastična oko učenja, kao i fizički i intelektualno sposobna najbolje usvojiti podučavano.

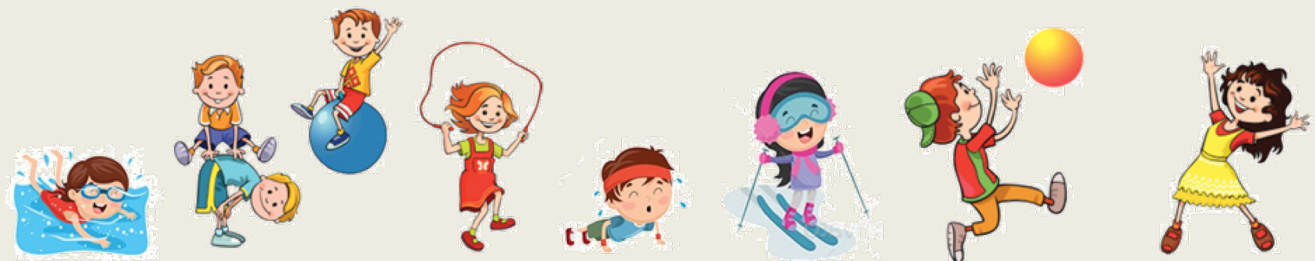




# KLASIFIKACIJE BIOTIČKIH MOTORIČKIH ZNANJA

**Postoje različite kvalifikacije biotičkih motoričkih znanja.**

- **Gallahue i Ozmun (1998)** biotička motorička znanja dijele u tri kategorije:
  - znanja stabilnosti,
  - lokomotorna znanja i
  - manipulativna znanja.
  
- **Burtton i Milerr (1998)** dijele u dvije kategorije:
  - lokomotorna znanja i
  - znanja manipulacije objektima.



# LOKOMOTORNA BMZ

- Predstavljaju znanja pomoću kojih se tijelo pomiče s jednog mjesta na drugo.
- Lokomotorna **BMZ** razvijaju se slijedećim redoslijedom:

- **PUZANJE**
- **HODANJE**
- **TRČANJE**
- **SKAKANJE S DVIJE NOGE**
- **SKOK „DALEKO VISOKI“**
- **GALOP**
- **POSKOCI NA JEDNOJ NOZI**
- **BOČNI DOKORAK**
- **SKIP**



PUZANJE



HODANJE



TRČANJE



SKAKANJE



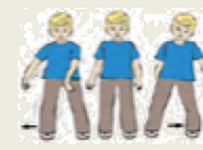
„LEAP“



GALOP



„HOP“



BOČNI DOKORAK („SIDE SLIDE“)

„SKIPIRANJE“

# NELOKOMOTORNA BMZ

- Ne-lokomotorna znanja su **ona znanja kod kojih dolazi do promjena položaja tijela, ali bez da se tijelo kreće u prostoru:**
  - položaji u kojima se istežemo,
  - pregibanja trupa,
  - navlačenja (zgibovi),
  - pozicije u kojima se održava ravnoteža,
  - savijanja trupa u zaklon („most“),
  - zamasi rukama ili nogama,
  - kruženja dijelova tijela,
  - različite pozicije upiranja,
  - zasuci tijelom..



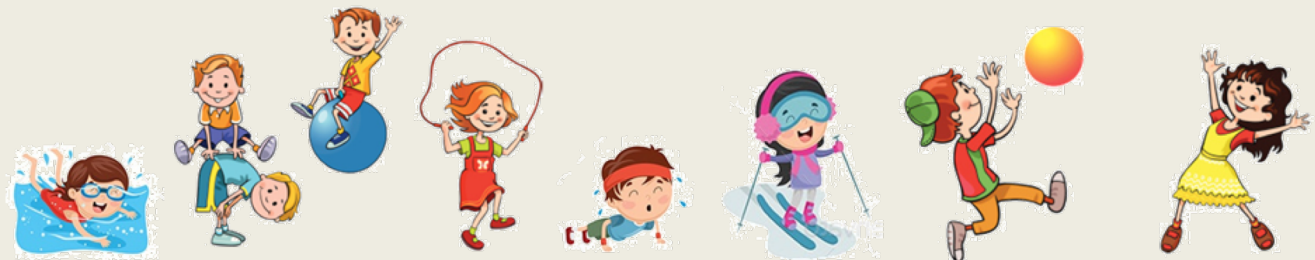
# MANIPULATIVNA BMZ

- Manipulativna znanja su znanja kod kojih se pomiču **objekti s jednog mjesta na drugo pomoću ruku ili nogu, a ponekad i drugih dijelova tijela:**
  - Vođenja lopte nogom
  - Bacanja
  - Udaranja
  - Hvatanja
  - Ispucavanja
  - Vođenja lopte rukom....



# PODUČAVANJE BMZ

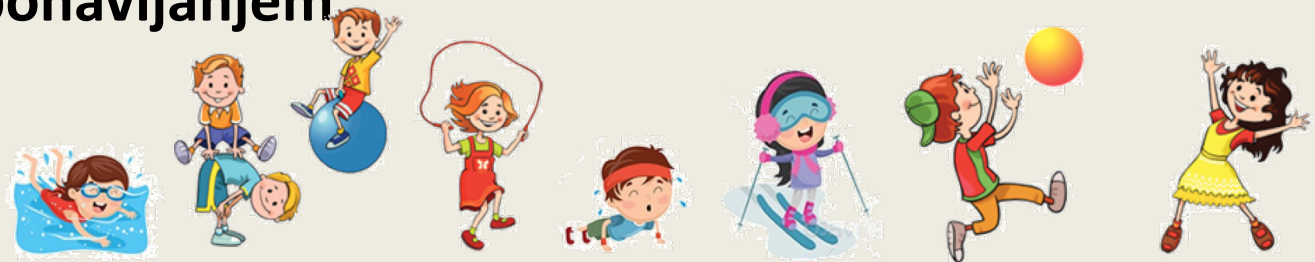
- Kod podučavanja djece BMZ važno je poznavati nekoliko činjenica:
  - **DJECA NISU MALI LJUDI**
  - **DJECU TREBA PODUČAVATI ČITAVO ZNANJA**
  - **PODUČAVANJE TREBA BITI USKLAĐENO S TRENUTNIM SPOSOBNOSTIMA DJECE**
  - **SVAKO PODUČAVANO ZNANJE TREBA POKUŠATI SMJESTITI U REALNU SITUACIJU**

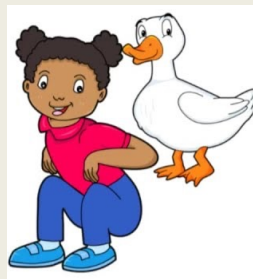
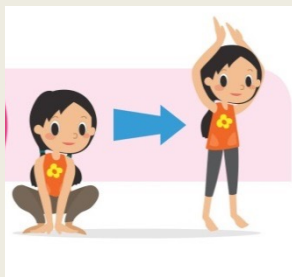
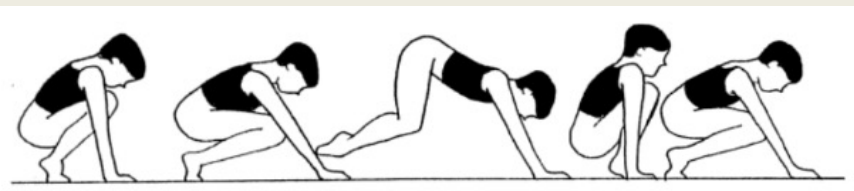
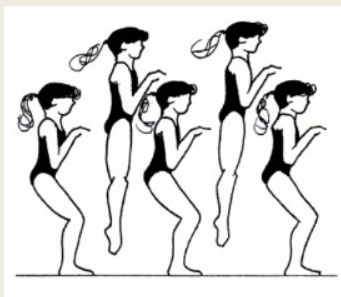




# BIOTIČKA MOTORIČKA ZNANJA → GROSS MOTOR SKILLS → FUNDAMENTAL MOVEMENT SKILLS

- Njihov razvoj uključuje upotrebu velikih mišićnih skupina na koordiniran i kontroliran način
- Osnovne postavke za razvoj BMZ – razvijaju se paralelno s BMZ
  - snaga trupa
  - ravnoteža
  - koordinacija obiju strana tijela
  - svijest o djelovima tijelu – BODY AWARENESS
- BMZ, kao i sva ostala motorička znanja, razvijaju se isključivo vježbanjem i ponavljanjem





# DEVELOPMENTAL BUILDING BLOCKS

Working towards FMS

Locomotive Skills



Jumping

## Disco Time

Ask the children to bend their knees and touch the ground as they dance.

## Popcorn

Place scrunched-up paper or soft balls on top of a parachute. The children raise their arms up above head as they make the popcorn pop.

## Jack in the Box Jumps

Sing the song and ask the children to crouch down ready to jump out of their box.

## Rainbow Jumps

Draw a rainbow on the ground and ask the children to see what colour they can jump to.

Running

## Colour Run

Place different coloured sheets of paper around the room or yard. When you call out a colour, the children run to that colour.

## Hide & Seek/ Tip Games

Play games such as tip or hide and seek with the children.

## Parachute Run

One at a time, the children run from one side of the parachute to the other. As each child runs, the children lift up the parachute.

## Hickory Dickory Dock

Draw a clock on the ground. Sing the nursery rhyme and ask the children to be mice and run up the clock.

Galloping

## Donkey, Donkey, Horse

Just like the game duck, duck, goose. Instead of running, the children gallop like a horse.

## Galloping Numbers/Colours

The children gallop to the numbers/colours you call out. Use rolled-up newspaper or small brooms so children can gallop on their horses.

## Pony Riders

Set up a track and have the children gallop along the track like a horse.

## Horsey Go Round

The children gallop their horse around the yard. Use rolled-up newspaper or small brooms as horses.

Hopping

## Egg Hunt

Place balls around the yard. The children hop on two feet to collect the eggs and bring them back to the nest. Make it harder and encourage them to hop on one foot, changing feet every four hops.

## Hopscotch

Draw a hopscotch court on the ground. The children hop through the court.

## Bunny Races

Set up a course and have a race with the children. See who can hop like a bunny to the end of the course.

## Hoop Count

Place hoops around the room and play music. The children hop around the room, changing legs every few hops. When the music stops, the children must find a hoop to stand in.

Leaping

## Frog Leaps

Draw lily pads on the ground. Children leap from lily pad to lily pad. Repeat.

## Follow the Leader

The children follow you around the yard. Tell them you are leaping over sleeping lions and you don't want to wake the lions.

*\*Play this game with other skills e.g. jumping, running, hopping*

## Leaping Jack

Draw a candle stick on the ground. When you sing the nursery rhyme Jack be nibble, Jack be quick, Jack LEAP over the candle stick, the children leap over the candle stick.

## Crocodile Pond

Draw a pond on the ground. The children leap from one side to the other without falling in the pond.



Side-Sliding

## Side-Slide Course

Set up a course around the yard using chalk or tape. The children follow you side-sliding around the course.

## Ring a Ring Rosey

Holding hands or a parachute, side-slide in a circle singing the nursery rhyme.

## Fish, Fish, Crab

(similar to Duck, Duck, Goose)

A child swims like a fish around the circle. When they say crab, both children walk like a crab around the circle (side-stepping).

## Sliding Song

Play the Sliding song on the Munch & Move CD and follow the actions with the children.

Skipping

## Skipping Stones

Set up a line of dots. Have a longer distance between every second dot. Children take a long step and then a short step. Repeat.

## Musical Spots

(Similar to musical chairs)

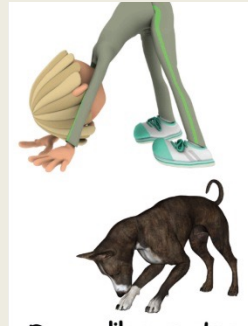
Set up a circle of chairs or cushions. Play a Munch & Move song with the children skipping around the chairs. When the music stops, the children find a seat to sit on.

## Jack & Jill

Sing and act out the nursery rhyme with the children, replacing the word went with skipped.







# DEVELOPMENTAL BUILDING BLOCKS

Working towards FMS

## Upper Body Strength



### Hands and Toes Tunnel Ball

Children balance on their hands and toes to make a bridge. Together they form a tunnel and play the game tunnel ball.

### Snowstorm

Children stand holding the sides of a parachute. Place Styrofoam or wool balls on the parachute. The children try to keep the snow on the parachute while moving it up and down.

### Crawling Obstacle Course

Set up an obstacle course using equipment and ask the children to crawl through.



### Parachute Commando

Children hold a parachute and kneel on the ground. On your call, each child commando crawls on their arms and knees to the opposite side.

### Wheel Barrows

Set up a short course. One-on-one with the child in a crawling position, lift the child's legs off the ground holding onto their ankles. Move together around the course.

### Cubby House Crawl

Set up a cubby house with cardboard boxes and tables. Encourage the children to crawl on their hands and knees through the cubby house.

### Cat & Mouse

Mark out a rectangle zone. One child is in the middle (cat) and the rest of the children are along one long side (mice). The children are on their hands and knees. On your call, the mice crawl to the other side of the zone. If they get tagged by the cat, they become a cat.

### Crab Crawling

The children sit on the ground leaning on their hands behind them. Ask them to lift their bottom off the ground and try to walk/crawl like a crab.

### Bear Walks

Ask the children to embrace their inner bear and bear crawl on their hands and feet at transition times.



### Emu Trap

The children hold a parachute or sheet and raise it high and then low. When you call out a child's name, they run under the parachute and get to the other side before it comes back down again.

### Tummy Time

Set up a drawing/colouring station on the floor. Encourage children to draw/colour on their tummies by propping themselves up on their elbows.

### Donkey Kicks

Sing the song *Old Macdonald Had a Farm*. The child act out the movement of the animals. Make sure the children have lots of room to do the movement of a donkey. They kick their legs in the air behind them while on their hands and knees.

### Ball Rolling

Lie on your tummy facing the child (also on tummy) about 1-2m apart. Prop up on your elbows and roll a ball to the child and then ask them to roll it back to you. Include other floor movements in the game, e.g. both roll together to the left.

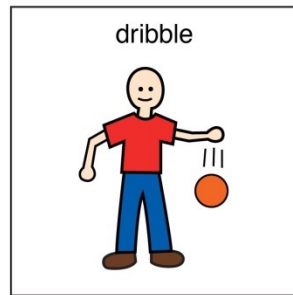
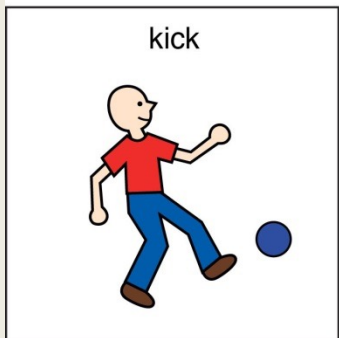
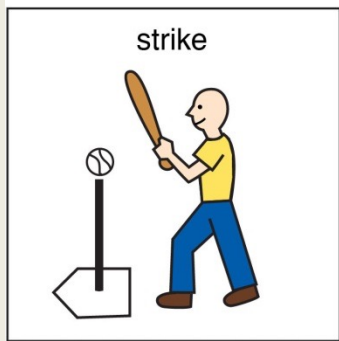
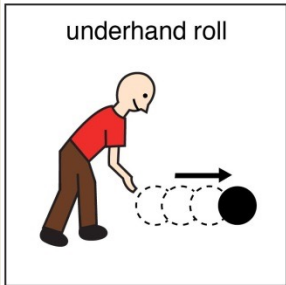
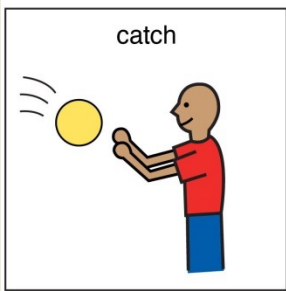
### Spirograph Drawings

Set up large sheets of paper on the ground. One at a time, the children lie down on their tummy on the paper. They lift their chest off the ground and move their arms up and down on the paper while holding a pencil in each hand.

### Truck Races

The children push trucks in the sandpit while on their hands and knees.





# DEVELOPMENTAL BUILDING BLOCKS

## Working towards FMS Manipulative Skills

**Kicking**

**Beach Ball Kicking**

Children kick the beach ball to you individually or as group.

**Stocking Ball Kick**

Place a ball in a stocking. Hold the stocking while the child kicks the ball with their foot. They may need to hold your shoulder for balance.

**Goals**

Set up a large goal space. The children practise kicking a ball into the goal. Use items like chairs, buckets or boxes as goals.

**Kicking Shapes**

Draw or stick different coloured shapes on a wall outside for the children to kick a ball at.

**Overarm Throwing**

**Bean Bag Throwing**

The children hold a bean bag to their ear before throwing it.

**Target Hit**

Stack some cups or any stackable item. The children overarm throw balls towards the cups.

**Laundry Basket**

Set up a laundry basket or a box. The children overarm throw their laundry (bean bags) into the basket or box.

**Aeroplanes**

Make paper planes. The children overarm throw their planes as far as they can.

**Catching**

**Blowing Bubbles**

Blow bubbles and ask the children to put their hands out ready to catch them.

**Rolling Ball**

Sit in a circle with the children and roll the ball to each other. This can also be done one-on-one.

**Beach Ball Catch**

With the children in a circle, the children throw a beach ball or a balloon around the circle.

**Scarf Catching**

The children throw the scarfs in the air and catch them while you play some music.

**Underarm Throwing**

**Paper Ball Toss**

Make a ball out of old paper. Ask the children to attempt an underarm throw into a bucket or box. Play the game one-on-one or as a group.

**Parachute Pop**

Stand around a parachute on the ground. The children underarm throw a bean bag onto the parachute. All together, pick up the parachute and make the popcorn pop.

**Milk Bottles**

Line up milk bottles or skittles. The children underarm throw bean bags towards the bottles.

**Fruit & Veg Splat**

Put up pictures of fruit and vegetables. The children underarm throw balls or bean bags at the targets.

**Stationary Dribbling**

**Basket Bounce**

Fill a basket with balls. The child bounces the ball (with two hands) towards you. Catch and place in an empty basket. Once all balls have been bounced, swap places and ask the child to repeat the activity.

**Busy Bees Bouncing**

Draw flowers and bees on ground. The children bounce a large ball with two hands and try to catch it. Sing the *Busy Bee* song as the children bounce their ball on the flowers and bees.

**Dribbling Cross**

Set up/draw a line of crosses. The children bounce the ball with two hands along the crosses.

**Bounce the Ball**

Play the song *Bounce the Ball*. Give children a big ball and ask them to copy you. Hold the ball in both hands, bounce it once and try to catch it. Make it harder if the children are doing well.

**Striking a Stationary Ball**

**Sweep the Leaves**

Ask the children to sweep the floor with a small broom or pretend brooms. Encourage them to rotate their body as they sweep.

**Twister Disco**

Put on songs about twisting. Do a twisting movement and ask the children to copy you. Use your arms as well – move them up in the air like a swaying tree.

**Balloon Aim**

Use a balloon or large ball. The children strike the balloon across the ground with a rolled-up newspaper or half a pool noodle.

**munch & move**

Developed by the Health Promotion Service, Berrara Shookamen Local Health District.





# DEVELOPMENTAL BUILDING BLOCKS

Working towards FMS

## Stability and Static Balance



### Dinosaur Freeze

Children walk around like big, slow dinosaurs. When you call out "freeze", the children stop mid-action. Encourage them to stop and balance on one leg.

### Windmills & Tee Pees

Children run around the yard, swinging their arms like a windmill. Everyone stops when you call out "Tee Pees". They balance on one leg and hold their hands together above their head.

### Stepping Stones

Draw stepping stones on the ground. Children step from one stone to the next. Encourage them to place one foot on a stone and step to the next stone with their opposite foot.

### Balance Obstacle Course

Set up challenging objects for balancing such as balance beams, old tyres or thick rope. Ask the children to balance from one object to another.

### Heel to Toe Spiral

Draw a spiral on ground. The children walk on the spiral line. Ask them to touch their heels with their toes as they walk.

### Balancing Bean Bag

Children balance bean bags on their head, elbow and back of their hand. They can walk while balancing the bean bag to make it harder.



### Tightrope

Draw a line or place a rope on the ground. The children balance along the line/rope. Encourage the children to try and balance standing still with their eyes closed.



### Sergeant's Calling

Call "attention!" Children copy your instructions. Run on the spot, touch the ground, knee taps, etc. Add other actions as you go.

### Toe Touch & Sky Reaching

Use this activity as a warm up to get their little bodies ready for play and activities.

### Stretching Sessions

Incorporate stretch session into your daily routine, before and after planned activities.

### Simon Says: Balance on One Leg

Ask the children to balance on one leg as part of the game.

### Yoga

Set up a yoga corner. Do some yoga with the children at the end of rest time.



### The Floor is Lava

Set up dots or mark small sections on the floor using tape. The children walk around the area. When you call "the floor is lava", they find a "dot" on the floor to stand or balance on.

### Sensory Course

Set up buckets or containers and fill them with different materials e.g. sand, water, dry leaves, fresh leaves. The children walk through the course one at a time.

### Stand Like a Mannequin

Use a mannequin or doll. Ask the children copy the mannequin's positions e.g. standing on one leg with arms out wide or up high.

### Freeze Relay

Stand in a circle with the children frozen like statues. One at a time, children run around the yard and back to the circle, tagging another child to run next. Encourage children to balance on one leg while frozen like statues.



# SVIJEST O DIJELOVIMA TIJELA

- Dotakni svoj nos



- Dotakni svoje uši



- Zatvorenih očiju pokaži svoj nos, oči, lakat
- Igrati igre u kojima se traži pokazivanje dijelova tijela
- Nacrtati sliku sebe sa svim dijelovima tijela

# Equipment to encourage fundamental movement skills development

Development of fundamental movement skills is enhanced by the provision and set-up of a variety of equipment and resources. Different equipment will encourage the exploration of different types of fundamental movement skills.

Table 1 provides ideas for equipment that could be used to promote each category of fundamental movement skills and to promote physical activity. You will also have your own favourites or find some new ones that you can add to the list.

**Table 1: Equipment and resources to encourage fundamental movement skills development**

Locomotor skills	Stability skills	Manipulative skills
Ropes to create pathways	Balance beams of different widths	Assortment of balls including soft and grip balls
Footprints	Balance discs	Sensory balls
Tunnels	Log ball	Frisbees
Tails	Hopper balls	Bean bags
Traffic cones	Gym balls	Balloons
Walk boards	Pedal peters	Lightweight cricket bats
Hoops	Stilts	Nets
Foam blocks	Walk boards	Totem tennis
Sand pit	Logs	Foam ten pin bowling set
Water bed bladders	Body rocker	Quoits
Mini trampolines	Rocking & twisting toys (e.g. a rocking horse)	Targets
	Flexible balance beams	Aiming equipment and numbers (e.g. goals, poles with one or more baskets)
	Stepping stones	Scrunched paper
	Low brick walls	Ball of wool
	Garden edges	



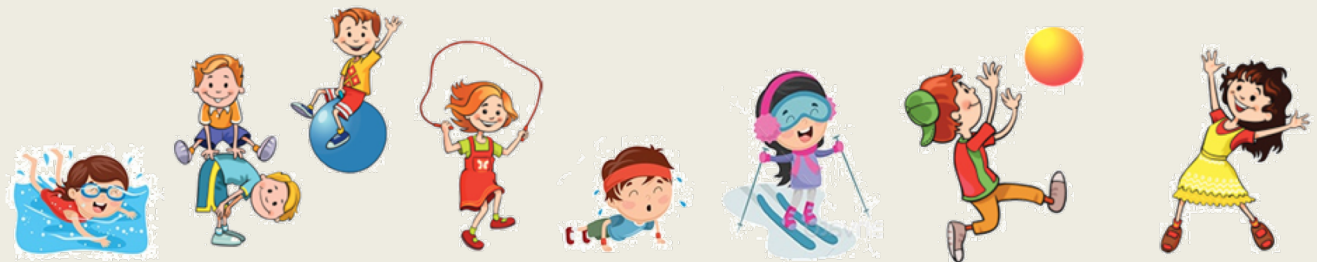
# FAKTORI KOJI UTJEČU NA RAZVOJ BMZ

- **DOB** - razvoj BMZ povezan je s dobi, ali da nije zavisan o dobi (Bolger et al., 2017)
- **SPOL** – minimalne tijekom ranog djetinjstva, ali se pojačavaju u kasnijim periodima (Woodard & Surburg, 1997).
  - u predškolskoj dobi počinju se pojavljivati razlike u izvedbi BMZ:
  - dječaci počinju bolje izvoditi BMZ (posebice manipulativna) od djevojčica (Mondschein, Adolph i Tamis, 2000;)
  - dječaci postižu bolje ukupne rezultate u TGMD-2 testu procjene BMZ (Pang and Fong, 2009; Fowweather, 2010; Mitchell et al., 2013; Mukherjee et al., 2017); djevojčice bolje rezultate postižu u znanjima ravnoteže i fine motorike
- Dodatni faktori:
  - **okruženju**
  - **prijašnjem iskustvu i kulturi,**
  - **genskim predispozicijama,**
  - **načinu učenja,**
  - **rastu i razvoju**
  - **zainteresiranosti, motivaciji učenika ...**

Fisher i suradnici (2015.) prikupili su podatke FA i s njim razvijenim BMZ: Istraživanje je utvrdilo da **okolina** ima snažan utjecaj na FA u djetinjstvu (~ 60% objašnjene varijance), dok je manja količina varijance objasnila **genetika** (~ 21%).

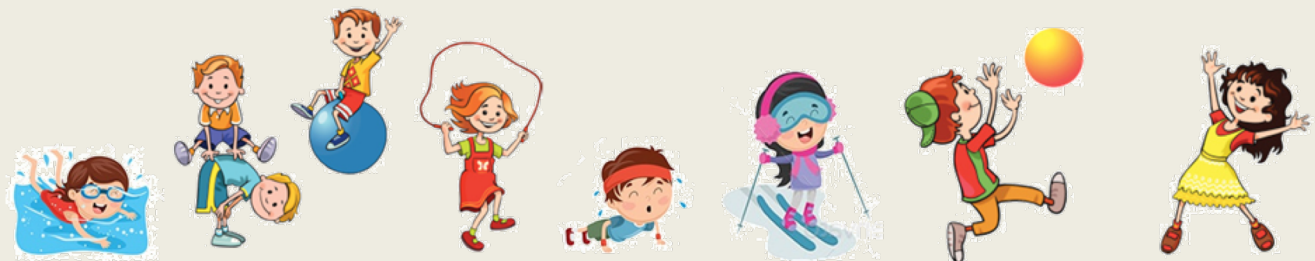
(Berk, 2005; Thelen et al., 1991; Greenfield & Cocking, 2014).

**UKOLIKO DIJETE NIJE POSTAVLJENO U OKOLINU  
I SITUACIJU DA PROĐE PROCES USVAJANJA  
BIOTIČKIH ZNANJA POSTUPNO - VJEŠTE  
IZVEDBE ISTIH NISU REALNE ZA OČEKIVATI.**



# BMZ I KVALITETA ŽIVOTA

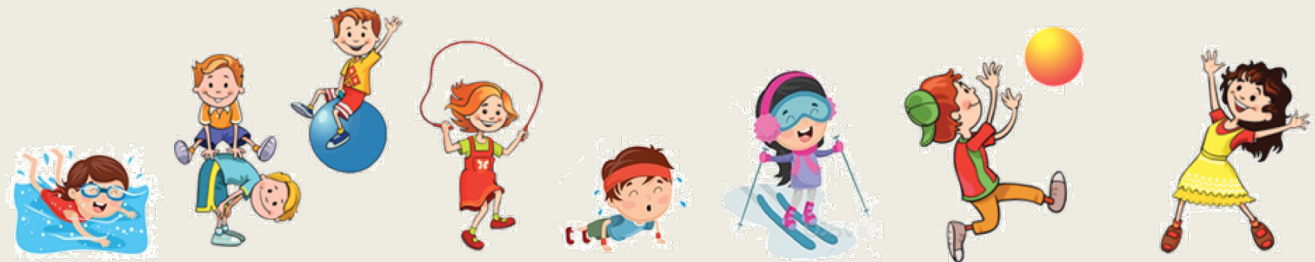
- Razvoj djeteta je dinamičan sustav pod utjecajem faktora kao što su vršnjaci, obitelj, društvo i kultura (Thelen et al., 1991; Greenfield & Cocking, 2014).
- Male razlike u iskustvu ili okolini u mladoj dobi mogu rezultirati dramatičnim razlikama u kasnijem ponašanju (Smith & Thelen, 2003).
- Tjelesni aktivitet djece – **JEDAN OD KLJUČNIH FAKTORA**





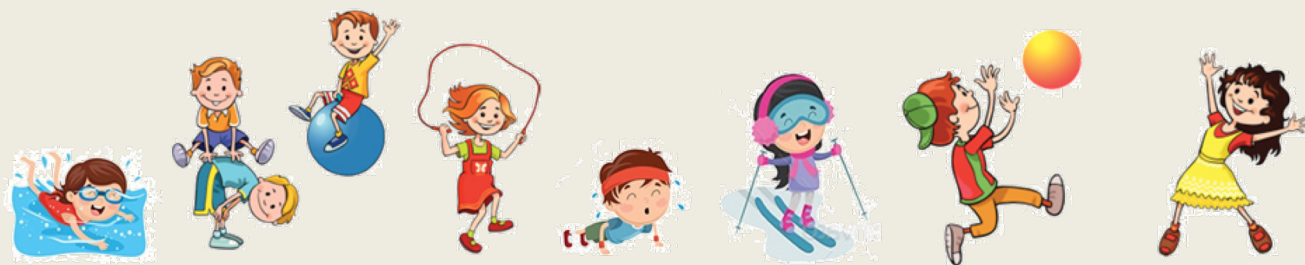
# FIZIČKA AKTIVNOST (FA) DJECE PREDŠKOLSKE DOBI

- Istraživački dokazi o FA kao poticaju za povoljan rast i razvoj je relativno mlad, ali brzo raste.
- Redovita FA povezana je s biološkim, razvojnim, psihosocijalnim, socijalno-afektivnim i kognitivnim aspektima rasta i razvoja u djetinjstvu i adolescenciji



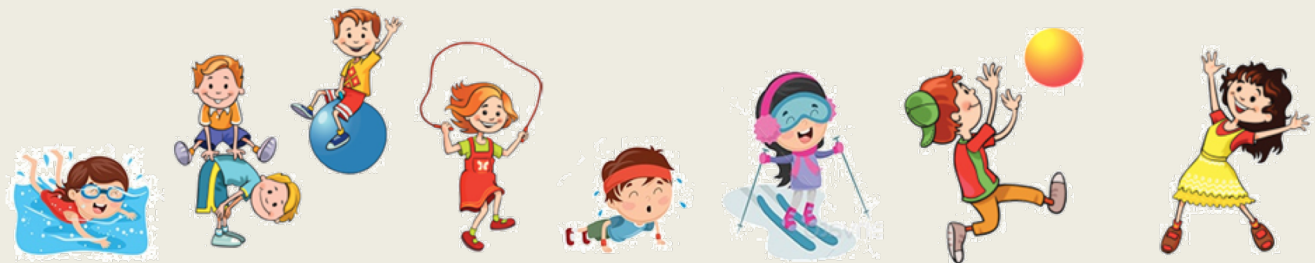
# FIZIČKI AKTIVITET I NJEGOVI POZITIVNI UTJECAJI

- **Povećanje FA rezultira:**
  - smanjenjem ukupnog obujma tijela i visceralne adipoznosti, posebno u djece i adolescenata s prekomjernom težinom (Gutin i sur., 2002, Owens i sur., 1999), ali potrebno je intenzivnije i dulje razdoblje FA kako bi se stvorili slični učinci kod djece normalne težine (Barbeau et al., 2003).
  - smanjenjem sedentarnog vremena - važno za poboljšanje elemenata metaboličkog sindroma i kod pretilih i ne pretilih mladih osoba (Cliff et al., 2013, Strong i sur., 2005). U tim istraživanjima međutim, navodi se i da nedostatak FA ne može biti primarni mehanizam određivanje debljanja u djece, već umora koja može dovesti do neaktivnosti djece (Metcalf i sur., 2010, Wilks i sur., 2011).
- **Nedovoljan tjelesni aktivitet - povećava se rizik razvoja pretilosti kod djece.**



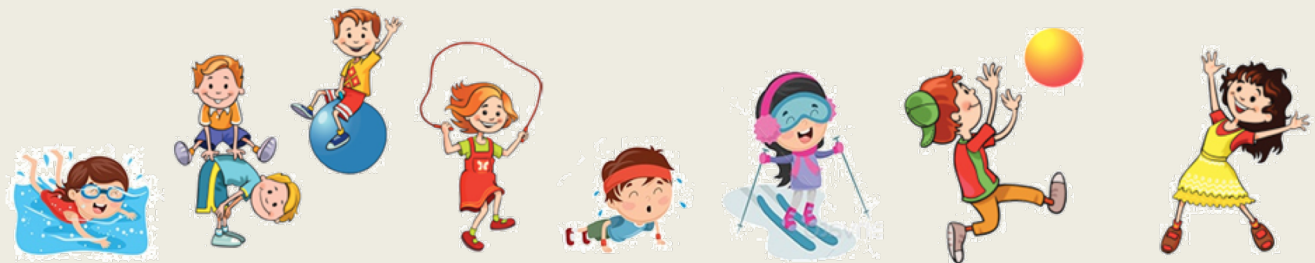
# FIZIČKI AKTIVITET I NJEGOVI DOGOROČNO POZITIVNI UTJECAJI

- Goran, Reynolds i Lindquist (1999) su utvrdili kako **fizička aktivnost i zdrava prehrana u djetinjstvu preveniraju pretilost u odrasloj dobi** dok je istraživanje od Li i suradnika (2010) utvrdilo da fizički aktivan način života uspješno smanjuje pretilost kod genetskih predisponiranih osoba za 40%.
- **Rane navike u FA predviđaju FA kasnije u adolescenciji** (Hearst i sur., 2012)
- **FA značajno i pozitivno utječe na kosti** (Nikander i sur., 2010), ukazujući na kritični vremenski prozor tijekom kojeg je skeletni sustav osobito osjetljiv na FA i mineralnu masu kostiju i snaga (Timmons et al.2012.).



- **Zaključno:**

Sudjelovanje u redovitoj tjelesnoj aktivnosti široko je prihvaćeno kao učinkovita preventivna mjera za različite čimbenike rizika zdravlja (Janssen i LeBlanc, 2010; Paterson i Warburton, 2010; Warburton, Charlesworth, Ivey, Nettlefold i Bredin, 2010).



# Stvarno stanje FA

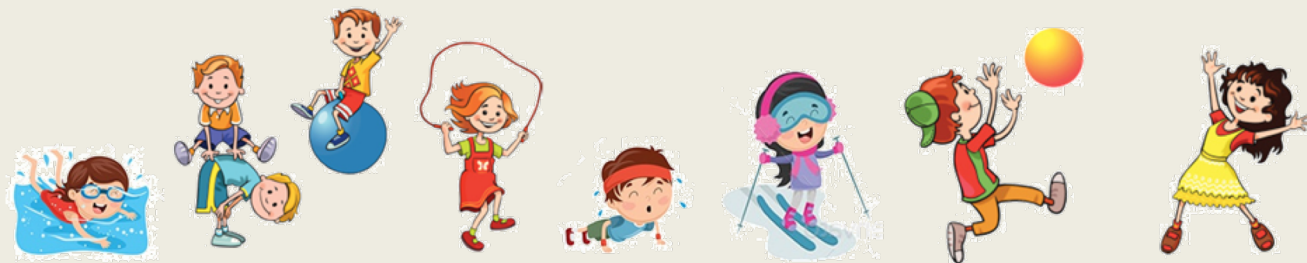
- Međutim, **u svim dobnim skupinama razina tjelesne aktivnosti ostaje niska** (Colley, Garriguet, Janssen, Craig, Clarke i Tremblay, 2011; Katmarzyk i Tremblay, 2007; Troiano, Berrigan i Dodd, 2008), **a stope pretilosti i dalje rastu** (Flegal, Carroll, Ogden i Curtin, 2010; Walls i sur., 2010).
- Nedavna istraživanja otkrila su da između **4% - 10% djece mlađe od pet godina ispunjava smjernice za tjelesnu aktivnost koje sugeriraju bavljenje 180 minuta tjelesne aktivnosti dnevno** (Goldfield i sur., 2012.; Hnatiuk i sur., 2012.).
- Postoji pretpostavka da su mališani i mala djeca prirodno aktivni, međutim, velika većina tjelesnih aktivnosti kojima se mala djeca bave je niskog intenziteta, pa djeca možda ne ispunjavaju zahtjeve za tjelesnom aktivnošću (Hnatiuk i sur., 2012; Gubbels i sur., 2012).



# FA I MOTORIČKA KOMPETENCIJA DJECE

**Fizički/tjelesni aktivitet = unaprjeđenje  
motoričke kompetencije djece**

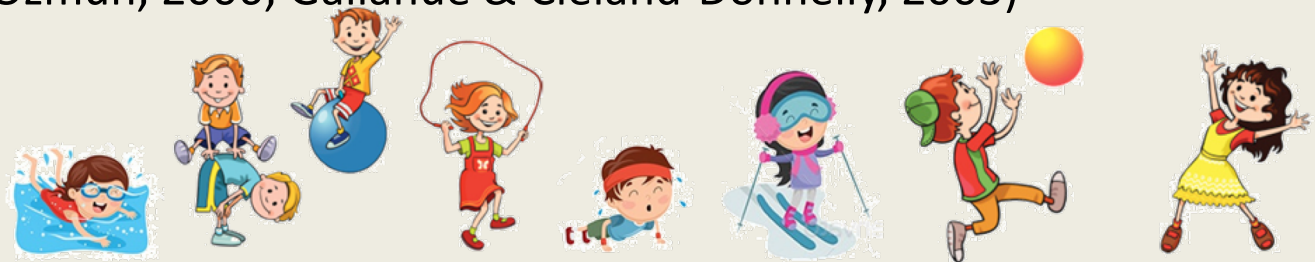
(Barnett et al., 2008; Sääkslahti et al., 2004)





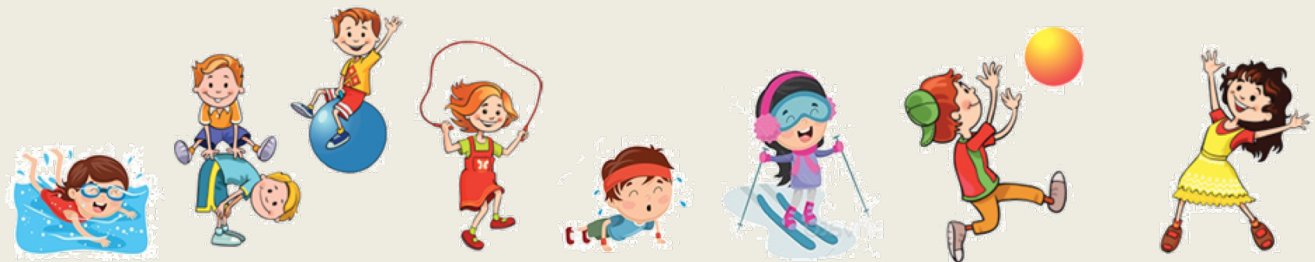
# MOTORIČKA KOMPETENCIJA DJECE PREDŠKOLSKE DOBI

- **Motorička kompetencija** može se definirati kao sposobnost osobe da izvrši različite motoričke zadatke, uključujući koordinaciju finih i grubih motoričkih vještina potrebnih za izvršavanje svakodnevnih zadataka (Henderson, S., 1992.)
- Osobito kompetencija **grubih motoričkih znanja- BIOTIČKIH MOTORIČKIH ZNANJA** igra važnu ulogu u rastu, razvoju i mogućnostima vođenja aktivnog načina života (Lubans et al., 2010)
- Kompetencija grubih motoričkih znanja često se navodi kao **SPRETNOST U IZVOĐENJU NIZA BIOTIČKIH MOTORIČKIH ZNANJA (NPR. BACANJE, HVATANJA, TRČANJE) KOJE BI TREBALE BITI IDEALNO NAUČENE TIJEKOM PREDŠKOLSKE I RANE ŠKOLSKE DOBI** (Branta, Haubenstricker, & Seefeldt, 1984; Gallahue & Ozmun, 2006; Gallahue & Cleland-Donnelly, 2003)



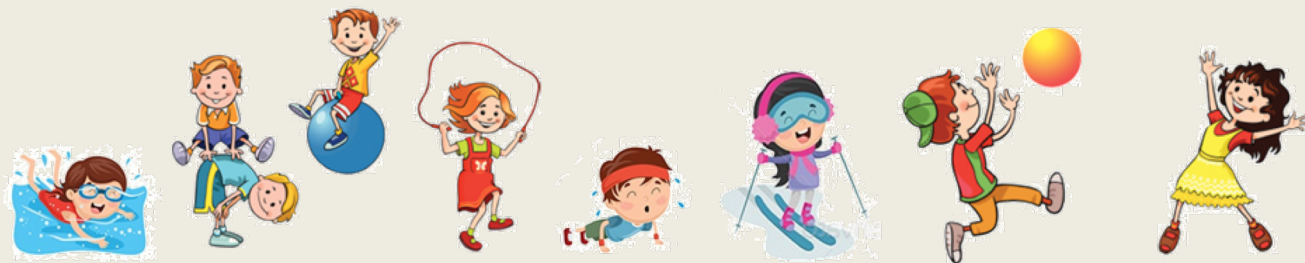
# UTJECAJ MOTORIČKE KOMPETENCIJE

- **Savladanost BMZ omogućava razvoj specijaliziranih znanja**
- **Bolja motorička kompetencija: 10% - 20% veće šanse da će sudjelovati u različitim tjelesnim aktivnostima** (Barnett et al., 2009), aktivnostima u kojima dolazi do pojačanog kardiovaskularnog rada (Barnett et al., 2008a), da postignu sportsku kompetenciju i izvrsnost (Barnett et al., 2008b).
- **Motorička kompetencija obrnuto je povezana sa sjedilačkim aktivnostima kod djece** (Wrotniak i sur., 2006.) - promicanje tjelesnog aktiviteta kod male djece i razvoja motoričke kompetencije može poboljšati razinu tjelesne aktivnosti u kasnijim godinama života i potencijalno spriječiti pretilost.



# PHYSICAL LITERACY - FIZIČKA PISMENOST

- **Fizička pismenost** može se definirati kao motivacija, samopouzdanje, tjelesna kompetentnost, razumijevanje i znanje za **održavanje tjelesne aktivnosti na individualno odgovarajućoj razini tijekom cijelog života**
- **Pojedinci koji su fizički pismeni kreću se kompetentno i s povjerenjem u širokom spektru tjelesnih aktivnosti koje pogoduju zdravom razvoju cijele osobe.** To znači da su fizički pismeni ljudi sposobni:
  - Razviti motivaciju i sposobnost razumijevanja, komuniciranja, primjene i analize različitih oblika kretanja
  - Demonstrirati razne pokrete samouvjereno i kompetentno u širokom rasponu tjelesnih aktivnosti
  - Donosite zdrave, aktivne odluke koje su korisne i poštuju njihovo ja, druge i okoliš.



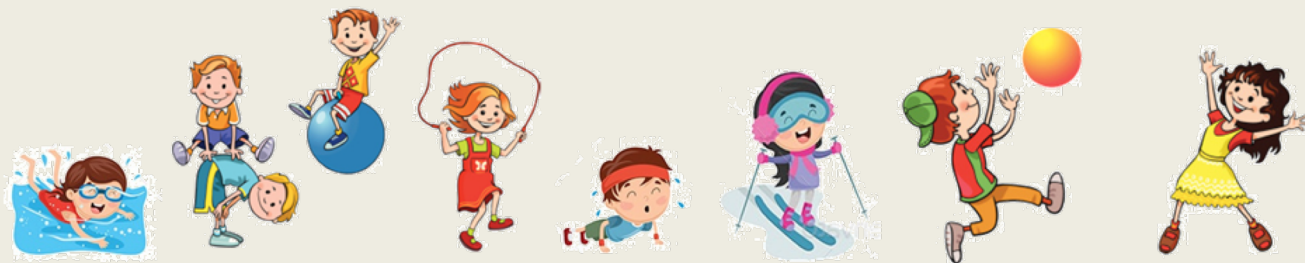
## Tablica 1.Osnovne vještine kretanja koje podupiru fizičku pismenost

Lista nije široka, ali daje dobar uvid u glavne vještine kretanja kroz tri skupine vještina i četiri fizička okruženja

Lokomotorne vještine	Vještine kontrole objekta	Kretnje ravnoteže
<ul style="list-style-type: none"> <li>• Jačanje</li> <li>• Penjanje</li> <li>• Vrćenje ruku u krug (eggbeater)</li> <li>• Galopiranje</li> <li>• Klizanje</li> <li>• Skakutanje</li> <li>• Razbijanje leda</li> <li>• Skakanje</li> <li>• Preskakanje</li> <li>• Pedalanje</li> <li>• Trčanje</li> <li>• Veslanje</li> <li>• Klizanje</li> <li>• Skakanje(vijača)</li> <li>• Klizanje</li> <li>• Plivanje</li> <li>• Njihanje</li> </ul>	<p>Slanje:</p> <ul style="list-style-type: none"> <li>• Udaranje</li> <li>• Stavljanje</li> <li>• Valjanje(lopta)</li> <li>• Udaranje(lopta, pak, prsten)</li> <li>• Bacanje</li> </ul> <p>Primanje:</p> <ul style="list-style-type: none"> <li>• Hvatanje</li> <li>• Zaustavljanje</li> <li>• Hvatanje</li> </ul> <p>Kretanje sa:</p> <ul style="list-style-type: none"> <li>• Driblanje (stopala)</li> <li>• Driblanje (ruke)</li> <li>• Driblanje (palice)</li> </ul> <p>Slanje i primanje:</p> <ul style="list-style-type: none"> <li>• Udaranje (palica)</li> <li>• Udaranje (reket)</li> <li>• Udaranje (štap)</li> <li>• Udaranje (udovi)</li> </ul>	<ul style="list-style-type: none"> <li>• Balansiranje/centriranje</li> <li>• Valjanje tijela</li> <li>• Izmicanje</li> <li>• Vrćenje ruku u krug (eggbeater)</li> <li>• Plutanje</li> <li>• Doskok</li> <li>• Pozicija spremnosti</li> <li>• Tonjenje/padanje</li> <li>• Vrćenje</li> <li>• Zaustavljanje</li> <li>• Istezanje/kovrčanje</li> <li>• Njihanje</li> <li>• Okretanje/skretanje</li> </ul>

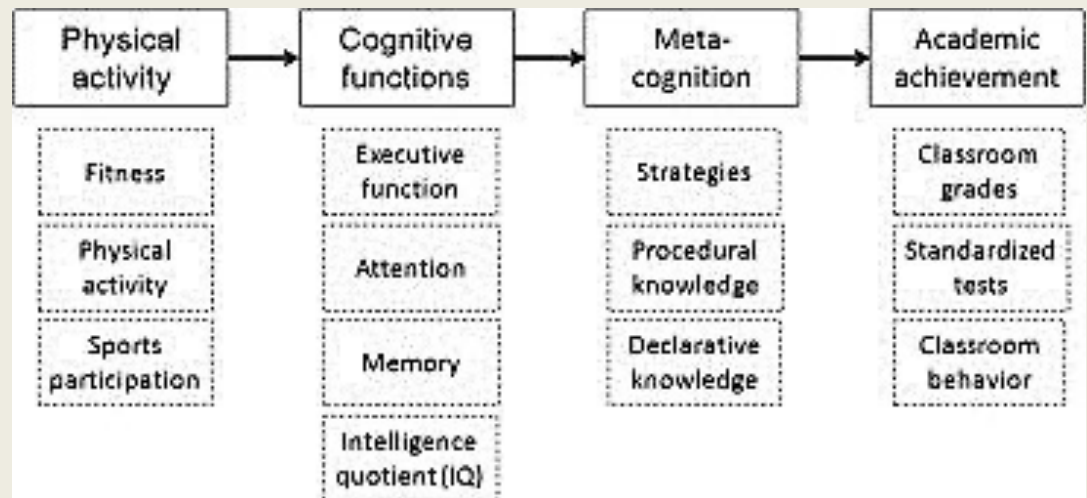
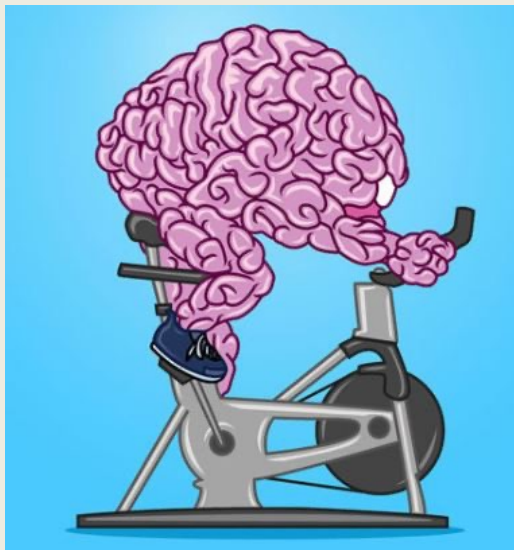
# RAZVOJ BMZ+ FA/ KOGNITIVNE SPOSOBNOSTI

- Piaget (1953) - sugerirao da postoji utjecaj tjelesnog aktiviteta i senzomotoričkih iskustva na kognitivne sposobnosti.
- Od tada je nekoliko studija ispitivalo povezanost između razvoja motoričkih sposobnosti kod novorođenčadi, male djece i male djece te kognitivnih sposobnosti u kasnijem životu (Burns i sur., 2004.; Bushnell i Boudreau, 1993.; Williams i Holley, 2013.), a nove tehnike istraživanja u neuroznanosti dali su dodatni – bolji uvid u razvoj mozga kod ovakvih aktivnosti (Casey i sur., 2005.; Diamond, 2000.).
- **Neuroznanost je utvrdila da se iste moždane strukture koriste i za motoričko i za kognitivno funkcioniranje - kad se uoči deficit u motoričkim sposobnostima, smanjene su i kognitivno sposobnost i obrnuto (Diamond, 2000; Wassenberg i sur., 2005).**



# FA I RAZVOJ BMZ U VEZI S KOGNITIVNIM SPOSOBNOSTIMA

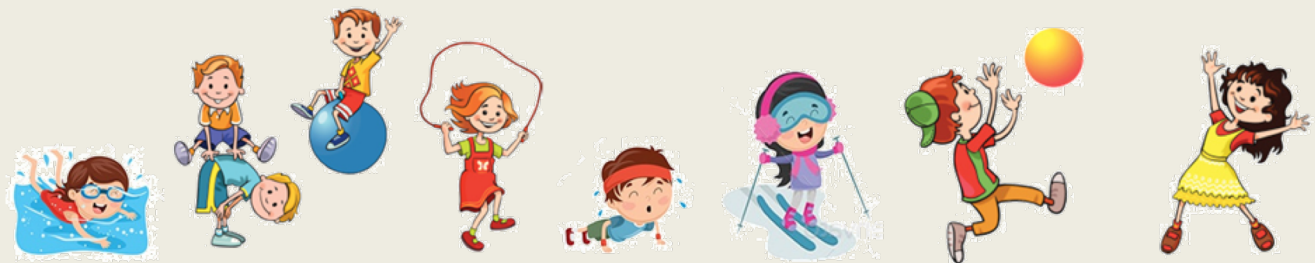
- Piek i suradnici (2008) – BMZ kod djece u dobi od četiri mjeseca do četiri godine važan prediktor kognitivnih performansi kada su djeca dostigla školsku dob (6 - 11,5 godina); fina motorika nije utvrđena kao značajna.





# INTERVENCIJSKI PROGRAMI KOJI IMAJU UTJECAJA NA MOTORIČKU KOMPETENCIJU

- Određena istraživanja daju dokaze o pozitivnim rezultatima raznih intervensijskih programa vježbanja na motorički razvoj djece predškolske dobi.
  - **Glazbeni kretni programi** pokazali su poboljšanja motoričkih vještina djece predškolske dobi poput galopa, skoka u vis i dalj, preskoka te ravnoteže (Derri sur., 2001, Zachopoulou i sur., 2004, prema Vanetsanou & Kambas, 2010).
  - U nedavnom istraživanju, Deli i suradnici (2006, prema Vanetsanou & Kambas, 2010) pokazuju da **višestrani program vježbanja** i vježbanje uz glazbu u trajanju od 10 tjedana, ima prednosti u odnosu na slobodnu igru kod djece vrtićke dobi.
  - Djeca u organiziranim programima vježbanja bolje su izvodila temeljna motorička znanja poput trčanja, skokova i preskoka. Iste učinke pokazuje i Wang (2004) nakon provedbe **kreativnog programa kretanja**.
- **Kroz veći broj istraživanja potvrđeno je da je višestrani psihomotorički interventni program najprikladnija trenažna metoda za djecu predškolske dobi (Lubans i sur., 2010; Vanetsanou & Kambas, 2010; Logan i sur., 2011; Morgan i sur., 2013).**

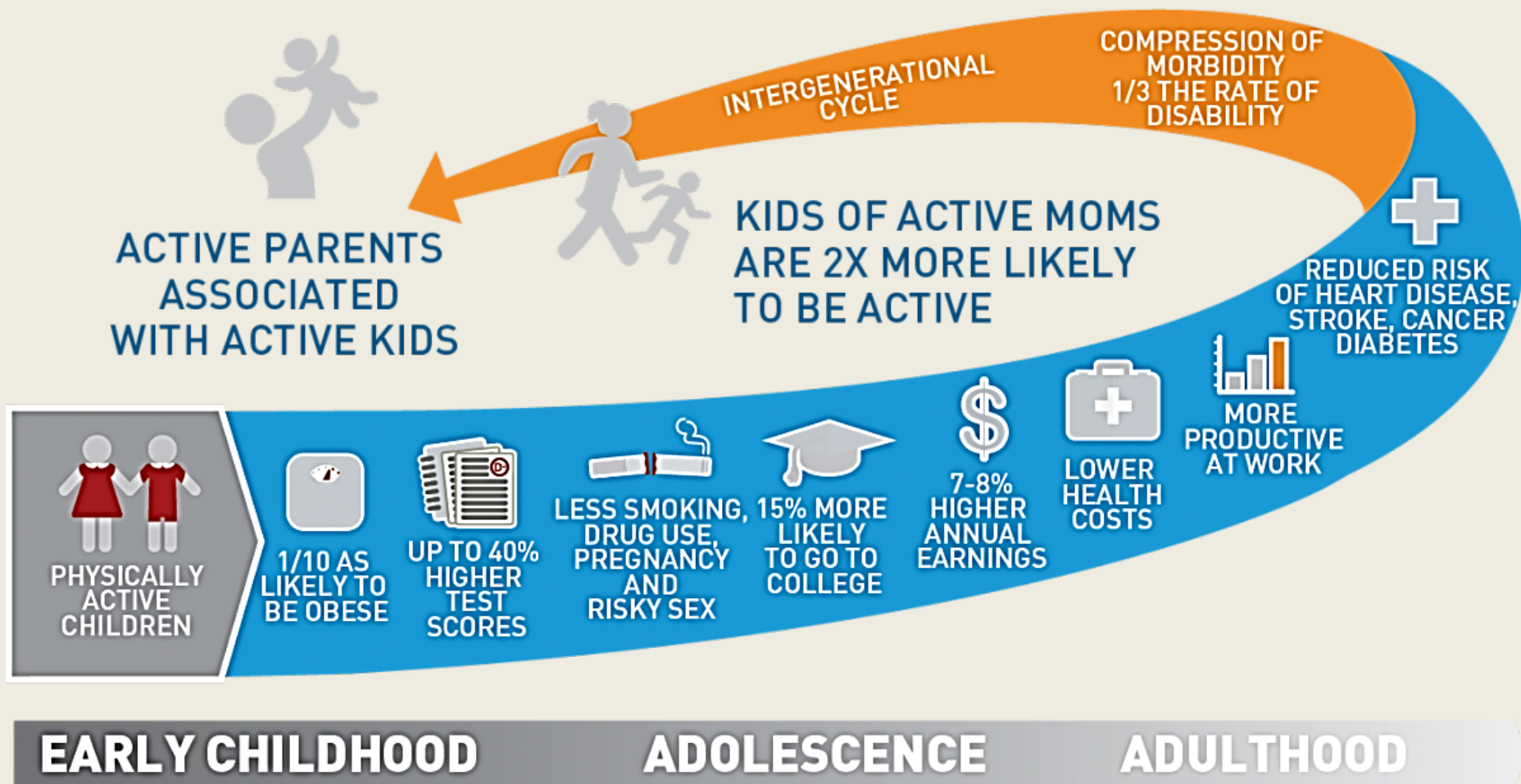


# ZAKLJUČIMO: ZAŠTO JE UČENJE BMZ KOD DJECE PREDŠKOLSKE DOBI VAŽNO?

- **Razvoj motorike** u predškolskom i školskom uzrastu definira se kao najvažnije doba u razvoju motorike djeteta.
  - FA – manje sjedilačkih aktivnosti: manja šansa za razvoj pretilosti, niži BMI, bolja kardio-respiratorna kondicija
  - Razvoj motoričke kompetencije: pozitivniji stav prema sportu
  - Pozitivan utjecaj na kognitivne sposobnosti

# ACTIVE KIDS DO BETTER IN LIFE

## WHAT THE RESEARCH SHOWS ON THE COMPOUNDING BENEFITS



IZVOR: <http://www.aspenprojectplay.org/sites/default/files/Figure%206.png>

Unatoč zdravstvenim prednostima povezanim s motoričkom kompetencijom grubih motoričkih znanja, motorička sposobnost djece i adolescenata je niska; samo 50% djece pokazuje sposobnosti u širokom rasponu vještina



**Hvala na pažnji**