



# SpriteKit



# Table of Contents

---

SK3DNode .....	3
SKAction .....	4
SKAttribute .....	7
SKAttributeValue.....	8
SKAudioNode .....	9
SKCameraNode .....	10
SKConstraint.....	11
SKCropNode.....	12
SKEffectNode .....	13
SKEmitterNode .....	14
SKFieldNode .....	16
SKKeyframeSequence.....	17
SKLabelNode .....	18
SKLightNode.....	19
SKMutableTexture.....	20
SKNode.....	21
SKPhysicsBody .....	23
SKPhysicsContact .....	25
SKPhysicsJoint .....	26
SKPhysicsJointFixed .....	27
SKPhysicsJointLimit .....	28
SKPhysicsJointPin .....	29
SKPhysicsJointSliding.....	30
SKPhysicsJointSpring .....	31
SKPhysicsWorld .....	32
SKRange.....	33
SKReachConstraints.....	34
SKReferenceNode .....	35
SKRegion .....	36
SKRenderer.....	37
SKScene .....	38
SKShader.....	39
SKShapeNode .....	40
SKSpriteNode.....	41
SKTexture.....	42
SKTextureAtlas.....	43
SKTileDefinition.....	44
SKTileGroup.....	45
SKTileGroupRule .....	46
SKTileMapNode .....	47
SKTileSet .....	48
SKTransformNode .....	49
SKTransition .....	50
SKUniform .....	51
SKVideoNode .....	52
SKView.....	53
SKWarpGeometry .....	54



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## SK3DNode

### Functions

#### Create

```
SK3DNodeWithViewportSize( CGSize size ) = SK3DNodeRef
SK3DNodeWithCoder( CoderRef coder ) = SK3DNodeRef
```

#### Configure

```
SK3DNodeViewportSize( SK3DNodeRef ref ) = CGSize
SK3DNodeSetViewportSize( SK3DNodeRef ref, CGSize size )
SK3DNodeAutoenablesDefaultLighting( SK3DNodeRef ref ) = Boolean
SK3DNodeSetAutoenablesDefaultLighting( SK3DNodeRef ref, Boolean flag )
```

#### Animate

```
SK3DNodeIsPlaying( SK3DNodeRef ref ) = Boolean
SK3DNodeSetPlaying( SK3DNodeRef ref, Boolean flag )
SK3DNodeLoops( SK3DNodeRef ref ) = Boolean
SK3DNodeSetLoops( SK3DNodeRef ref, Boolean flag )
SK3DNodeSceneTime( SK3DNodeRef ref ) = CFTimeInterval
SK3DNodeSetSceneTime( SK3DNodeRef ref, CFTimeInterval sceneTime )
```

#### Project points and hit testing

```
SK3DNodeHitTest( SK3DNodeRef ref, CGPoint pt, CFDictionaryRef options ) = CFArrayRef// array of SCNHitTestResults
SK3DNodeProjectPoint( SK3DNodeRef ref, vector_float3 pt ) = vector_float3
SK3DNodeUnprojectPoint( SK3DNodeRef ref, vector_float3 pt ) = vector_float3
```

### Apple documentation

[SK3DNode](#)



## SKAction

### Functions

#### Initializers

Animate in linear path

```
SKActionMoveByXY( CGFloat deltaX, CGFloat deltaY, CTimeInterval duration ) = SKActionRef
SKActionMoveByVector( CGVector delta, CTimeInterval duration ) = SKActionRef
SKActionMoveToPoint( CGPoint location, CTimeInterval duration ) = SKActionRef
SKActionMoveToX( CGFloat x, CTimeInterval duration ) = SKActionRef
SKActionMoveToY( CGFloat y, CTimeInterval duration ) = SKActionRef
```

Animate in custom path

```
SKActionFollowPath( CGPathRef path, CTimeInterval duration ) = SKActionRef
SKActionFollowPathSpeed( CGPathRef path, CGFloat speed ) = SKActionRef// macOS 10.10+
SKActionFollowPathAsOffset( CGPathRef path, Boolean asOffset, Boolean orientToPath, CTimeInterval duration ) = SKActionRef
SKActionFollowPathAsOffsetSpeed( CGPathRef path, Boolean asOffset, Boolean orientToPath, CGFloat speed ) = SKActionRef// macOS 10.10+
```

Animate rotation

```
SKActionRotateByAngle( CGFloat radians, CTimeInterval duration ) = SKActionRef
SKActionRotateToAngle( CGFloat radians, CTimeInterval duration ) = SKActionRef
SKActionRotateToAngleShortestUnitArc( CGFloat radians, CTimeInterval duration, Boolean shortestUnitArc ) = SKActionRef
```

Controlling speed

```
SKActionSpeedBy( CGFloat speed, CTimeInterval duration ) = SKActionRef
SKActionSpeedTo( CGFloat speed, CTimeInterval duration ) = SKActionRef
```

Animate scaling

```
SKActionScaleBy( CGFloat scale, CTimeInterval duration ) = SKActionRef
SKActionScaleToSize( CGSize size, CTimeInterval duration ) = SKActionRef// macOS 10.12+
SKActionScaleTo( CGFloat scale, CTimeInterval duration ) = SKActionRef
SKActionScaleXYBy( CGFloat xScale, CGFloat yScale, CTimeInterval duration ) = SKActionRef
SKActionScaleXYTo( CGFloat xScale, CGFloat yScale, CTimeInterval duration ) = SKActionRef
SKActionScaleXTo( CGFloat xScale, CTimeInterval duration ) = SKActionRef
SKActionScaleYTo( CGFloat yScale, CTimeInterval duration ) = SKActionRef
```

Animate transparency

```
SKActionFadeIn( CTimeInterval duration ) = SKActionRef
SKActionFadeOut( CTimeInterval duration ) = SKActionRef
SKActionFadeAlphaBy( CGFloat factor, CTimeInterval duration ) = SKActionRef
SKActionFadeAlphaTo( CGFloat alpha, CTimeInterval duration ) = SKActionRef
```

Animate texture

```
SKActionResizeByWidthAndHeight( CGFloat width, CGFloat height, CTimeInterval duration ) = SKActionRef
SKActionResizeToHeight( CGFloat height, CTimeInterval duration ) = SKActionRef
SKActionResizeToWidth( CGFloat width, CTimeInterval duration ) = SKActionRef
SKActionResizeToWidthAndHeight( CGFloat width, CGFloat height, CTimeInterval duration ) = SKActionRef
SKActionSetTexture( SKTextureRef texture ) = SKActionRef// macOS 10.10+
SKActionSetTextureResize( SKTextureRef texture, Boolean resize ) = SKActionRef// macOS 10.10+
SKActionAnimateWithTextures( CFArrayRef textures, CTimeInterval timePerFrame ) = SKActionRef
SKActionAnimateWithTexturesResize( CFArrayRef textures, CTimeInterval timePerFrame, Boolean resize, Boolean restore ) = SKActionRef
SKActionSetNormalTexture( SKTextureRef texture ) = SKActionRef// macOS 10.11+
SKActionSetNormalTextureResize( SKTextureRef texture, Boolean resize ) = SKActionRef// macOS 10.11+
SKActionAnimateWithNormalTextures( CFArrayRef textures, CTimeInterval timePerFrame ) = SKActionRef// macOS 10.11+
SKActionAnimateWithNormalTexturesResize( CFArrayRef textures, CTimeInterval timePerFrame, Boolean resize, Boolean restore ) = SKActionRef// macOS 10.11+
SKActionColorizeWithColor( ColorRef color, CGFloat colorBlendFactor, CTimeInterval duration ) = SKActionRef
SKActionColorizeWithColorBlendFactor( CGFloat colorBlendFactor, CTimeInterval duration ) = SKActionRef
```

Animate properties of physics body

```
SKActionApplyForce( CGVector force, CTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionApplyTorque( CGFloat torque, CTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionApplyForceAtPoint( CGVector force, CGPoint pt, CTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionApplyImpulse( CGVector impulse, CTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionApplyAngularImpulse( CGFloat impulse, CTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionApplyImpulseAtPoint( CGVector impulse, CGPoint pt, CTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeChargeTo( CGFloat v, CTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeChargeBy( CGFloat v, CTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeMassTo( CGFloat v, CTimeInterval duration ) = SKActionRef// macOS 10.11+
```

```
SKActionChangeMassBy( CGFloat v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionStrengthTo( float strength, CFTimeInterval duration ) = SKActionRef// macOS 10.10+
SKActionStrengthBy( float strength, CFTimeInterval duration ) = SKActionRef// macOS 10.10+
SKActionFalloffTo( float falloff, CFTimeInterval duration ) = SKActionRef// macOS 10.10+
SKActionFalloffBy( float falloff, CFTimeInterval duration ) = SKActionRef// macOS 10.10+
```

Reversing animation

```
SKActionReverseAction( SKActionRef ref ) = SKActionRef
```

Animate warping

```
SKActionAnimateWithWarps( CFArrayRef warps, CFArrayRef times ) = SKActionRef// macOS 10.12+
SKActionAnimateWithWarpsRestore( CFArrayRef warps, CFArrayRef times, Boolean restore ) = SKActionRef// macOS 10.12+
SKActionWarpTo( SKWarpGeometryRef warp, CFTimeInterval duration ) = SKActionRef// macOS 10.12+
```

Controlling audio

```
SKActionPlaySoundFileNamed( CFStringRef name, Boolean waitForCompletion ) = SKActionRef
SKActionPlay = SKActionRef// macOS 10.11+
SKActionPause = SKActionRef// macOS 10.11+
SKActionStop = SKActionRef// macOS 10.11+
SKActionChangePlaybackRateTo( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangePlaybackRateBy( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeVolumeTo( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeVolumeBy( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeObstructionTo( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeObstructionBy( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeOcclusionTo( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeOcclusionBy( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeReverbTo( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionChangeReverbBy( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionStereoPanTo( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionStereoPanBy( float v, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
```

Remove from scene

```
SKActionRemoveFromParent = SKActionRef
```

Running on children

```
SKActionRunActionOnChildWithName( SKActionRef action, CFStringRef name ) = SKActionRef
```

Chaining

```
SKActionGroup( CFArrayRef actions ) = SKActionRef
SKActionSequence( CFArrayRef actions ) = SKActionRef
SKActionRepeatAction( SKActionRef action, NSUInteger count ) = SKActionRef
SKActionRepeatActionForever( SKActionRef action ) = SKActionRef
```

Delaying

```
SKActionWaitForDuration( CFTimeInterval duration ) = SKActionRef
SKActionWaitForDurationWithRange( CFTimeInterval duration, CFTimeInterval durationRange ) = SKActionRef
```

Inverse kinematics

```
SKActionReachToDuration( CGPoint position, SKNodeRef rootNode, CFTimeInterval duration ) = SKActionRef// macOS 10.10+
SKActionReachToVelocity( CGPoint position, SKNodeRef rootNode, CGFloat velocity ) = SKActionRef// macOS 10.10+
SKActionReachToNodeDuration( SKNodeRef node, SKNodeRef rootNode, CFTimeInterval duration ) = SKActionRef// macOS 10.10+
SKActionReachToNodeVelocity( SKNodeRef node, SKNodeRef rootNode, CGFloat velocity ) = SKActionRef// macOS 10.10+
```

Custom actions

```
SKActionNamed( CFStringRef name ) = SKActionRef// macOS 10.11+
SKActionNamedDuration( CFStringRef name, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
SKActionNamedFromURL( CFStringRef name, CFURLRef url ) = SKActionRef// macOS 10.11+
SKActionNamedFromURLDuration( CFStringRef name, CFURLRef url, CFTimeInterval duration ) = SKActionRef// macOS 10.11+
```

```
SKActionCustomWithDuration
```

Callback:

```
local fn MyCustomCallback( node as SKNodeRef, elapsedTime as CGFloat, userData as ptr )
end fn
```

```
SKActionCustomWithDuration( CFTimeInterval duration, ptr callback, ptr userData ) = SKActionRef
```

Visibility

```
SKActionUnhide// macOS 10.10+
SKActionHide// macOS 10.10+
```

---

## Configure

Timing

```
SKActionDuration( SKActionRef ref ) = CFTimeInterval
SKActionSetDuration( SKActionRef ref, CFTimeInterval duration )
SKActionTimingMode( SKActionRef ref ) = SKActionTimingMode
SKActionSetTimingMode( SKActionRef ref, SKActionTimingMode mode )
```

SKActionTimingFunction

Callback:

```
local fn MyTimingFunctionCallback( action as SKActionRef, inputTime as float, userData as ptr )
end fn
```

```
SKActionTimingFunction( SKActionRef ref, ptr callback, ptr userData )// macOS 10.10+
```

```
SKActionSpeed( SKActionRef ref ) = CGFloat
```

```
SKActionSetSpeed( SKActionRef ref, CGFloat speed )
```

**Apple documentation**

[SKAction](#)



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## SKAttribute

### Functions

Init

```
SKAttributeWithName( CFStringRef name, SKAttributeType type ) = SKAttributeRef// macOS 10.12+
```

Instance properties

```
SKAttributeName( SKAttributeRef ref ) = CFStringRef// macOS 10.12+
```

```
SKAttributeType( SKAttributeRef ref ) = SKAttributeType// macOS 10.12+
```

### Apple documentation

[SKAttribute](#)



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## SKAttributeValue

### Functions

Initializers

```
SKAttributeValueInit = SKAttributeValueRef// macOS 10.12+      autoreleased
SKAttributeValueWithFloat( float value ) = SKAttributeValueRef// macOS 10.12+
SKAttributeValueWithVectorFloat2( vector_float2 value ) = SKAttributeValueRef// macOS 10.12+
SKAttributeValueWithVectorFloat3( vector_float3 value ) = SKAttributeValueRef// macOS 10.12+
SKAttributeValueWithVectorFloat4( vector_float4 value ) = SKAttributeValueRef// macOS 10.12+
```

Instance properties

```
SKAttributeValueFloatValue( SKAttributeValueRef ref ) = float// macOS 10.12+
SKAttributeValueSetFloatValue( SKAttributeValueRef ref, float value )// macOS 10.12+
SKAttributeValueVectorFloat2Value( SKAttributeValueRef ref ) = vector_float2// macOS 10.12+
SKAttributeValueSetVectorFloat2Value( SKAttributeValueRef ref, vector_float2 value )// macOS 10.12+
SKAttributeValueVectorFloat3Value( SKAttributeValueRef ref ) = vector_float3// macOS 10.12+
SKAttributeValueSetVectorFloat3Value( SKAttributeValueRef ref, vector_float3 value )// macOS 10.12+
SKAttributeValueVectorFloat4Value( SKAttributeValueRef ref ) = vector_float4// macOS 10.12+
SKAttributeValueSetVectorFloat4Value( SKAttributeValueRef ref, vector_float4 value )// macOS 10.12+
```

### Apple documentation

[SKAttributeValue](#)





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### SKAudioNode

#### Functions

Init

```
SKAudioNodeWithFileName( CFStringRef name ) = SKAudioNodeRef
SKAudioNodeWithURL( CFURLRef url ) = SKAudioNodeRef
SKAudioNodeWithCoder( CoderRef coder ) = SKAudioNodeRef
```

Configure

```
SKAudioNodeIsPositional( SKAudioNodeRef ref ) = Boolean
SKAudioNodeSetPositional( SKAudioNodeRef ref, Boolean flag )
SKAudioNodeAutoplayLooped( SKAudioNodeRef ref ) = Boolean
SKAudioNodeSetAutoplayLooped( SKAudioNodeRef ref, Boolean flag )
```

#### Apple documentation

[SKAudioNode](#)



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## SKCameraNode

### Functions

Init

```
SKCameraNodeInit = SKCameraNodeRef// autoreleased
```

Visibility

```
SKCameraNodeContainedNodeSet( SKCameraNodeRef ref ) = CFSetRef
```

```
SKCameraNodeContainsNode( SKCameraNodeRef ref, SKNodeRef node ) = Boolean
```

### Apple documentation

[SKCameraNode](#)



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## SKConstraint

### Functions

#### Position

```
SKConstraintPositionXY( SKRangeRef xRange, SKRangeRef yRange ) = SKConstraintRef  
SKConstraintPositionX( SKRangeRef range ) = SKConstraintRef  
SKConstraintPositionY( SKRangeRef range ) = SKConstraintRef
```

#### Orientation

```
SKConstraintOrientToNode( SKNodeRef node, SKRangeRef offsetRadians ) = SKConstraintRef  
SKConstraintOrientToPoint( CGPoint pt, SKRangeRef offsetRadians ) = SKConstraintRef  
SKConstraintOrientToPointInNode( CGPoint pt, SKNodeRef node, SKRangeRef offsetRadians ) = SKConstraintRef  
SKConstraintZRotation( SKRangeRef zRange ) = SKConstraintRef
```

#### Distance

```
SKConstraintDistanceToNode( SKRangeRef range, SKNodeRef node ) = SKConstraintRef  
SKConstraintDistanceToPoint( SKRangeRef range, CGPoint pt ) = SKConstraintRef  
SKConstraintDistanceToPointInNode( SKRangeRef range, CGPoint pt, SKNodeRef node ) = SKConstraintRef
```

#### Coordinate system

```
SKConstraintReferenceNode( SKConstraintRef ref ) = SKNodeRef  
SKConstraintSetReferenceNode( SKConstraintRef ref, SKNodeRef node )
```

#### Enable/disable

```
SKConstraintEnabled( SKConstraintRef ref ) = Boolean  
SKConstraintSetEnabled( SKConstraintRef ref, Boolean flag )
```

### Apple documentation

[SKConstraint](#)



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## SKCropNode

### Functions

Init

```
SKCropNodeInit = SKCropNodeRef// autoreleased
```

Mask filter

```
SKCropNodeMaskNode( SKCropNodeRef ref ) = SKNodeRef
```

```
SKCropNodeSetMaskNode( SKCropNodeRef ref, SKNodeRef node )
```

### Apple documentation

[SKCropNode](#)



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## SKEffectNode

### Functions

Init

```
SKEffectNodeInit = SKEffectNodeRef// autorelease
```

Core image filters

```
SKEffectNodeFilter( SKEffectNodeRef ref ) = CIFilterRef  
SKEffectNodeSetFilter( SKEffectNodeRef ref, CIFilterRef filter )  
SKEffectNodeShouldEnableEffects( SKEffectNodeRef ref ) = Boolean  
SKEffectNodeSetShouldEnableEffects( SKEffectNodeRef ref, Boolean flag )  
SKEffectNodeShouldCenterFilter( SKEffectNodeRef ref ) = Boolean  
SKEffectNodeSetShouldCenterFilter( SKEffectNodeRef ref, Boolean flag )
```

Shader

```
SKEffectNodeShader( SKEffectNodeRef ref ) = SKShaderRef// macOS 10.10+  
SKEffectNodeSetShader( SKEffectNodeRef ref, SKShaderRef shader )// macOS 10.10+  
SKEffectNodeAttributeValues( SKEffectNodeRef ref ) = CFDictionaryRef// macOS 10.12+  
SKEffectNodeSetAttributeValues( SKEffectNodeRef ref, CFDictionaryRef values )// macOS 10.12+  
SKEffectNodeSetValueForAttributeNamed( SKEffectNodeRef ref, SKAttributeValueRef value, CFStringRef name )// macOS 10.12+  
SKEffectNodeValueForAttributeNamed( SKEffectNodeRef ref, CFStringRef name ) = SKAttributeValueRef// macOS 10.12+
```

Flattening

```
SKEffectNodeShouldRasterize( SKEffectNodeRef ref ) = Boolean  
SKEffectNodeSetShouldRasterize( SKEffectNodeRef ref, Boolean flag )
```

Alpha blending

```
SKEffectNodeBlendMode( SKEffectNodeRef ref ) = SKBlendMode  
SKEffectNodeSetBlendMode( SKEffectNodeRef ref, SKBlendMode mode )
```

### Apple documentation

[SKEffectNode](#)



## SKEmitterNode

### Functions

Init

```
SKEmitterNodeInit = SKEmitterNodeRef// autoreleased
```

Choosing

```
SKEmitterNodeTargetNode( SKEmitterNodeRef ref ) = SKNodeRef  
SKEmitterNodeSetTargetNode( SKEmitterNodeRef ref, SKNodeRef node )
```

Controlling when particles are created

```
SKEmitterNodeAdvanceSimulationTime( SKEmitterNodeRef ref, CTimeInterval sec )  
SKEmitterNodeResetSimulation( SKEmitterNodeRef ref )  
SKEmitterNodeParticleBirthRate( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleBirthRate( SKEmitterNodeRef ref, CGFloat birthRate )  
SKEmitterNodeNumParticlesToEmit( SKEmitterNodeRef ref ) = NSUInteger  
SKEmitterNodeSetNumParticlesToEmit( SKEmitterNodeRef ref, NSUInteger num )
```

Rendering order

```
SKEmitterNodeParticleRenderOrder( SKEmitterNodeRef ref ) = SKParticleRenderOrder// macOS 10.11+  
SKEmitterNodeSetParticleRenderOrder( SKEmitterNodeRef ref, SKParticleRenderOrder order )// macOS 10.11+
```

Lifetime

```
SKEmitterNodeParticleLifetime( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleLifetime( SKEmitterNodeRef ref, CGFloat lifetime )  
SKEmitterNodeParticleLifetimeRange( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleLifetimeRange( SKEmitterNodeRef ref, CGFloat range )
```

Position

```
SKEmitterNodeParticlePosition( SKEmitterNodeRef ref ) = CGPoint  
SKEmitterNodeSetParticlePosition( SKEmitterNodeRef ref, CGPoint position )  
SKEmitterNodeParticlePositionRange( SKEmitterNodeRef ref ) = CGVector  
SKEmitterNodeSetParticlePositionRange( SKEmitterNodeRef ref, CGVector range )  
SKEmitterNodeParticleZPosition( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleZPosition( SKEmitterNodeRef ref, CGFloat position )
```

Velocity and acceleration

```
SKEmitterNodeParticleSpeed( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleSpeed( SKEmitterNodeRef ref, CGFloat speed )  
SKEmitterNodeParticleSpeedRange( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleSpeedRange( SKEmitterNodeRef ref, CGFloat range )  
SKEmitterNodeEmissionAngle( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetEmissionAngle( SKEmitterNodeRef ref, CGFloat angle )  
SKEmitterNodeEmissionAngleRange( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetEmissionAngleRange( SKEmitterNodeRef ref, CGFloat range )  
SKEmitterNodeXAcceleration( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetXAcceleration( SKEmitterNodeRef ref, CGFloat acceleration )  
SKEmitterNodeYAcceleration( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetYAcceleration( SKEmitterNodeRef ref, CGFloat acceleration )
```

Rotation

```
SKEmitterNodeParticleRotation( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleRotation( SKEmitterNodeRef ref, CGFloat rotation )  
SKEmitterNodeParticleRotationRange( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleRotationRange( SKEmitterNodeRef ref, CGFloat range )  
SKEmitterNodeParticleRotationSpeed( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleRotationSpeed( SKEmitterNodeRef ref, CGFloat speed )
```

Scaling

```
SKEmitterNodeParticleScale( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleScale( SKEmitterNodeRef ref, CGFloat scale )  
SKEmitterNodeParticleScaleRange( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleScaleRange( SKEmitterNodeRef ref, CGFloat range )  
SKEmitterNodeParticleScaleSpeed( SKEmitterNodeRef ref ) = CGFloat  
SKEmitterNodeSetParticleScaleSpeed( SKEmitterNodeRef ref, CGFloat speed )  
SKEmitterNodeParticleScaleSequence( SKEmitterNodeRef ref ) = SKKeyframeSequenceRef  
SKEmitterNodeSetParticleScaleSequence( SKEmitterNodeRef ref, SKKeyframeSequenceRef sequence )
```

Image and size

```
SKEmitterNodeParticleTexture( SKEmitterNodeRef ref ) = SKTextureRef  
SKEmitterNodeSetParticleTexture( SKEmitterNodeRef ref, SKTextureRef texture )  
SKEmitterNodeParticleSize( SKEmitterNodeRef ref ) = CGSize
```

```
SKEmitterNodeSetParticleSize( SKEmitterNodeRef ref, CGSize size )
```

#### Color

```
SKEmitterNodeParticleColorSequence( SKEmitterNodeRef ref ) = SKKeyframeSequenceRef
SKEmitterNodeSetParticleColorSequence( SKEmitterNodeRef ref, SKKeyframeSequenceRef sequence )
SKEmitterNodeParticleColor( SKEmitterNodeRef ref ) = ColorRef
SKEmitterNodeSetParticleColor( SKEmitterNodeRef ref, ColorRef col )
SKEmitterNodeParticleColorAlphaRange( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorAlphaRange( SKEmitterNodeRef ref, CGFloat range )
SKEmitterNodeParticleColorBlueRange( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorBlueRange( SKEmitterNodeRef ref, CGFloat range )
SKEmitterNodeParticleColorGreenRange( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorGreenRange( SKEmitterNodeRef ref, CGFloat range )
SKEmitterNodeParticleColorRedRange( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorRedRange( SKEmitterNodeRef ref, CGFloat range )
SKEmitterNodeParticleColorAlphaSpeed( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorAlphaSpeed( SKEmitterNodeRef ref, CGFloat speed )
SKEmitterNodeParticleColorBlueSpeed( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorBlueSpeed( SKEmitterNodeRef ref, CGFloat speed )
SKEmitterNodeParticleColorGreenSpeed( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorGreenSpeed( SKEmitterNodeRef ref, CGFloat speed )
SKEmitterNodeParticleColorRedSpeed( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorRedSpeed( SKEmitterNodeRef ref, CGFloat speed )
```

#### Texture blend

```
SKEmitterNodeParticleColorBlendFactorSequence( SKEmitterNodeRef ref ) = SKKeyframeSequenceRef
SKEmitterNodeSetParticleColorBlendFactorSequence( SKEmitterNodeRef ref, SKKeyframeSequenceRef sequence )
SKEmitterNodeParticleColorBlendFactor( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorBlendFactor( SKEmitterNodeRef ref, CGFloat factor )
SKEmitterNodeParticleColorBlendFactorRange( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorBlendFactorRange( SKEmitterNodeRef ref, CGFloat range )
SKEmitterNodeParticleColorBlendFactorSpeed( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleColorBlendFactorSpeed( SKEmitterNodeRef ref, CGFloat speed )
```

#### Framebuffer

```
SKEmitterNodeParticleBlendMode( SKEmitterNodeRef ref ) = SKBlendMode
SKEmitterNodeSetParticleBlendMode( SKEmitterNodeRef ref, SKBlendMode mode )
SKEmitterNodeParticleAlphaSequence( SKEmitterNodeRef ref ) = SKKeyframeSequenceRef
SKEmitterNodeSetParticleAlphaSequence( SKEmitterNodeRef ref, SKKeyframeSequenceRef sequence )
SKEmitterNodeParticleAlpha( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleAlpha( SKEmitterNodeRef ref, CGFloat alpha )
SKEmitterNodeParticleAlphaRange( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleAlphaRange( SKEmitterNodeRef ref, CGFloat range )
SKEmitterNodeParticleAlphaSpeed( SKEmitterNodeRef ref ) = CGFloat
SKEmitterNodeSetParticleAlphaSpeed( SKEmitterNodeRef ref, CGFloat speed )
```

#### Animating

```
SKEmitterNodeParticleAction( SKEmitterNodeRef ref ) = SKActionRef
SKEmitterNodeSetParticleAction( SKEmitterNodeRef ref, SKActionRef action )
```

#### Physics fields

```
SKEmitterNodeFieldBitMask( SKEmitterNodeRef ref ) = UInt32// macOS 10.10+
SKEmitterNodeSetFieldBitMask( SKEmitterNodeRef ref, UInt32 mask )// macOS 10.10+
```

#### Drawing

```
SKEmitterNodeShader( SKEmitterNodeRef ref ) = SKShaderRef// macOS 10.10+
SKEmitterNodeSetShader( SKEmitterNodeRef ref, SKShaderRef shader )// macOS 10.10+
SKEmitterNodeAttributeValues( SKEmitterNodeRef ref ) = CFDictionaryRef// macOS 10.12+
SKEmitterNodeSetAttributeValues( SKEmitterNodeRef ref, CFDictionaryRef values )// macOS 10.12+
SKEmitterNodeSetValueForAttributeNamed( SKEmitterNodeRef ref, SKAttributeValueRef value, CFStringRef name )// macOS 10.12+
SKEmitterNodeValueForAttributeNamed( SKEmitterNodeRef ref, CFStringRef name ) = SKAttributeValueRef// macOS 10.12+
```

## Apple documentation

[SKEmitterNode](#)



## SKFieldNode

### Functions

Create

```
SKFieldNodeDragField = SKFieldNodeRef
SKFieldNodeElectricField = SKFieldNodeRef
SKFieldNodeLinearGravityFieldWithVector( vector_float3 direction ) = SKFieldNodeRef
SKFieldNodeMagneticField = SKFieldNodeRef
SKFieldNodeNoiseFieldWithSmoothness( CGFloat smoothness, CGFloat animationSpeed ) = SKFieldNodeRef
SKFieldNodeRadialGravityField = SKFieldNodeRef
SKFieldNodeSpringField = SKFieldNodeRef
SKFieldNodeTurbulenceFieldWithSmoothness( CGFloat smoothness, CGFloat animationSpeed ) = SKFieldNodeRef
SKFieldNodeVelocityFieldWithTexture( SKTextureRef texture ) = SKFieldNodeRef
SKFieldNodeVelocityFieldWithVector( vector_float3 direction ) = SKFieldNodeRef
SKFieldNodeVortexField = SKFieldNodeRef
```

SKFieldNodeCustomFieldWithEvaluatorCallback

Callback:

```
local fn MyCustomFieldCallback( position as vector_float3, velocity as vector_float3, float mass, float charge,
deltaTime as CFloatInterval, userData as ptr )
    dim as vector_float3 vector

    // ... set vector values

end fn = vector
```

```
SKFieldNodeCustomFieldWithEvaluatorCallback( ptr callback, ptr userData ) = SKFieldNodeRef
```

Physics bodies affected by field

```
SKFieldNodeIsEnabled( SKFieldNodeRef ref ) = Boolean
SKFieldNodeSetEnabled( SKFieldNodeRef ref, Boolean flag )
SKFieldNodeIsExclusive( SKFieldNodeRef ref ) = Boolean
SKFieldNodeSetExclusive( SKFieldNodeRef ref, Boolean flag )
SKFieldNodeRegion( SKFieldNodeRef ref ) = SKRegionRef
SKFieldNodeSetRegion( SKFieldNodeRef ref, SKRegionRef region )
SKFieldNodeMinimumRadius( SKFieldNodeRef ref ) = float
SKFieldNodeSetMinimumRadius( SKFieldNodeRef ref, float radius )
SKFieldNodeCategoryBitMask( SKFieldNodeRef ref ) = UInt32
SKFieldNodeSetCategoryBitMask( SKFieldNodeRef ref, UInt32 bitMask )
SKFieldNodeStrength( SKFieldNodeRef ref ) = float
SKFieldNodeSetStrength( SKFieldNodeRef ref, float strength )
SKFieldNodeFalloff( SKFieldNodeRef ref ) = float
SKFieldNodeSetFalloff( SKFieldNodeRef ref, float falloff )
```

Other field properties

```
SKFieldNodeAnimationSpeed( SKFieldNodeRef ref ) = float
SKFieldNodeSetAnimationSpeed( SKFieldNodeRef ref, float speed )
SKFieldNodeAnimationSmoothness( SKFieldNodeRef ref ) = float
SKFieldNodeSetAnimationSmoothness( SKFieldNodeRef ref, float smoothness )
SKFieldNodeDirection( SKFieldNodeRef ref ) = vector_float3
SKFieldNodeSetDirection( SKFieldNodeRef ref, vector_float3 direction )
SKFieldNodeTexture( SKFieldNodeRef ref ) = SKTextureRef
SKFieldNodeSetTexture( SKFieldNodeRef ref, SKTextureRef texture )
```

### Apple documentation

[SKFieldNode](#)





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## SKKeyframeSequence

### Functions

#### Init

```
SKKeyframeSequenceWithKeyframeValues( CFAArrayRef values, CFAArrayRef times ) = SKKeyframeSequenceRef
SKKeyframeSequenceWithCapacity( NSUInteger numItems ) = SKKeyframeSequenceRef
SKKeyframeSequenceWithCoder( CoderRef coder ) = SKKeyframeSequenceRef
```

#### Building

```
SKKeyframeSequenceAddKeyframeValue( SKKeyframeSequenceRef ref, CTypeRef value, CGFloat time )
SKKeyframeSequenceRemoveKeyframeAtIndex( SKKeyframeSequenceRef ref, NSUInteger index )
SKKeyframeSequenceRemoveLastKeyframe( SKKeyframeSequenceRef ref )
SKKeyframeSequenceSetKeyframeTimeForIndex( SKKeyframeSequenceRef ref, CGFloat time, NSUInteger index )
SKKeyframeSequenceSetKeyframeValueForIndex( SKKeyframeSequenceRef ref, CTypeRef value, NSUInteger index )
SKKeyframeSequenceSetKeyframeValueAndTimeForIndex( SKKeyframeSequenceRef ref, CTypeRef value, CGFloat time,
NSUInteger index )
```

#### Running

```
SKKeyframeSequenceSampleAtTime( SKKeyframeSequenceRef ref, CGFloat time ) = CTypeRef
```

#### Info

```
SKKeyframeSequenceCount( SKKeyframeSequenceRef ref ) = NSUInteger
SKKeyframeSequenceKeyframeTimeForIndex( SKKeyframeSequenceRef ref, NSUInteger index ) = CGFloat
SKKeyframeSequenceKeyframeValueForIndex( SKKeyframeSequenceRef ref, NSUInteger index ) = CTypeRef
```

#### Interpolation modifiers

```
SKKeyframeSequenceInterpolationMode( SKKeyframeSequenceRef ref ) = SKInterpolationMode
SKKeyframeSequenceSetInterpolationMode( SKKeyframeSequenceRef ref, SKInterpolationMode mode )
SKKeyframeSequenceRepeatMode( SKKeyframeSequenceRef ref ) = SKRepeatMode
SKKeyframeSequenceSetRepeatMode( SKKeyframeSequenceRef ref, SKRepeatMode mode )
```

### Apple documentation

[SKKeyframeSequence](#)



## SKLabelNode

### Functions

#### Create

```
SKLabelNodeWithFontNamed( CFStringRef name ) = SKLabelNodeRef
SKLabelNodeWithText( CFStringRef text ) = SKLabelNodeRef// macOS 10.10+
SKLabelNodeWithAttributedString( CFAttributedStringRef aText ) = SKLabelNodeRef// macOS 10.13+
```

#### Text

```
SKLabelNodeText( SKLabelNodeRef ref ) = CFStringRef
SKLabelNodeSetText( SKLabelNodeRef ref, CFStringRef text )
SKLabelNodeAttributedString( SKLabelNodeRef ref ) = CFAttributedStringRef// macOS 10.13+
SKLabelNodeSetAttributedString( SKLabelNodeRef ref, CFAttributedStringRef aText )// macOS 10.13+
```

#### Font

```
SKLabelNodeFontColor( SKLabelNodeRef ref ) = ColorRef
SKLabelNodeSetFontColor( SKLabelNodeRef ref, ColorRef col )
SKLabelNodeFontName( SKLabelNodeRef ref ) = CFStringRef
SKLabelNodeSetFontName( SKLabelNodeRef ref, CFStringRef name )
SKLabelNodeFontSize( SKLabelNodeRef ref ) = CGFloat
SKLabelNodeSetFontSize( SKLabelNodeRef ref, CGFloat size )
```

#### Alignment

```
SKLabelNodeVerticalAlignmentMode( SKLabelNodeRef ref ) = SKLabelVerticalAlignmentMode
SKLabelNodeSetVerticalAlignmentMode( SKLabelNodeRef ref, SKLabelVerticalAlignmentMode mode )
SKLabelNodeHorizontalAlignmentMode( SKLabelNodeRef ref ) = SKLabelHorizontalAlignmentMode
SKLabelNodeSetHorizontalAlignmentMode( SKLabelNodeRef ref, SKLabelHorizontalAlignmentMode mode )
```

#### Line-break behavior

```
SKLabelNodePreferredMaxLayoutWidth( SKLabelNodeRef ref ) = CGFloat// macOS 10.13+
SKLabelNodeSetPreferredMaxLayoutWidth( SKLabelNodeRef ref, CGFloat width )// macOS 10.13+
SKLabelNodeLineBreakMode( SKLabelNodeRef ref ) = NSLineBreakMode// macOS 10.13+
SKLabelNodeSetLineBreakMode( SKLabelNodeRef ref, NSLineBreakMode mode )// macOS 10.13+
SKLabelNodeNumberOfLines( SKLabelNodeRef ref ) = NSInteger// macOS 10.13+
SKLabelNodeSetNumberOfLines( SKLabelNodeRef ref, NSInteger lines )// macOS 10.13+
```

#### Colorizing

```
SKLabelNodeColor( SKLabelNodeRef ref ) = ColorRef
SKLabelNodeSetColor( SKLabelNodeRef ref, ColorRef col )
SKLabelNodeColorBlendFactor( SKLabelNodeRef ref ) = CGFloat
SKLabelNodeSetColorBlendFactor( SKLabelNodeRef ref, CGFloat factor )
```

#### Alpha blending

```
SKLabelNodeBlendMode( SKLabelNodeRef ref ) = SKBlendMode
SKLabelNodeSetBlendMode( SKLabelNodeRef ref, SKBlendMode mode )
```

### Apple documentation

[SKLabelNode](#)



---

## SKLightNode

### Functions

Init

```
SKLightNodeInit = SKLightNodeRef// autoreleased
```

Active

```
SKLightNodeIsEnabled( SKLightNodeRef ref ) = Boolean  
SKLightNodeSetEnabled( SKLightNodeRef ref, Boolean flag )  
SKLightNodeCategoryBitMask( SKLightNodeRef ref ) = UInt32  
SKLightNodeSetCategoryBitMask( SKLightNodeRef ref, UInt32 bitMask )
```

Lighting properties

```
SKLightNodeAmbientColor( SKLightNodeRef ref ) = ColorRef  
SKLightNodeSetAmbientColor( SKLightNodeRef ref, ColorRef col )  
SKLightNodeLightColor( SKLightNodeRef ref ) = ColorRef  
SKLightNodeSetLightColor( SKLightNodeRef ref, ColorRef col )  
SKLightNodeShadowColor( SKLightNodeRef ref ) = ColorRef  
SKLightNodeSetShadowColor( SKLightNodeRef ref, ColorRef col )  
SKLightNodeFalloff( SKLightNodeRef ref ) = CGFloat  
SKLightNodeSetFalloff( SKLightNodeRef ref, CGFloat falloff )
```

### Apple documentation

[SKLightNode](#)



---

## SKMutableTexture

### Functions

Create

```
SKMutableTextureWithSize( CGSize size ) = SKMutableTextureRef
SKMutableTextureWithPixelFormat( CGSize size, UInt32 format ) = SKMutableTextureRef
```

Modify

```
SKMutableTextureModifyPixelData
```

Callback:

```
local fn MyModifyPixelDataCallback( mutTexture as SKMutableTextureRef, pixelData as ptr, lengthInBytes as long,
  userData as ptr )
end fn
```

```
SKMutableTextureModifyPixelData( SKMutableTextureRef ref, ptr callback, ptr userData )
```

### Apple documentation

[SKMutableTexture](#)



## SKNode

### Functions

First steps

```
SKNodeInit = SKNodeRef// autoreleased
SKNodeWithFileName( CFStringRef name ) = SKNodeRef// macOS 10.10+
SKNodeWithCoder( CoderRef coder ) = SKNodeRef
SKNodeWithFileNameSecurelyWithClasses( CFStringRef name, CFSetRef classes, ErrorRef *err ) = SKNodeRef// macOS 10.14+
```

Position

```
SKNodePosition( SKNodeRef ref ) = CGPoint
SKNodeSetPosition( SKNodeRef ref, CGPoint pt )
```

Content size

```
SKNodeFrame( SKNodeRef ref ) = CGRect
SKNodeCalculateAccumulatedFrame( SKNodeRef ref ) = CGRect
```

Draw order

```
SKNodeZPosition( SKNodeRef ref ) = CGFloat
SKNodeSetZPosition( SKNodeRef ref, CGFloat position )
```

Scale + rotate

```
SKNodeZRotation( SKNodeRef ref ) = CGFloat
SKNodeSetZRotation( SKNodeRef ref, CGFloat rotation )
SKNodeSetScale( SKNodeRef ref, CGFloat scale )
SKNodeXScale( SKNodeRef ref ) = CGFloat
SKNodeSetXScale( SKNodeRef ref, CGFloat scale )
SKNodeYScale( SKNodeRef ref ) = CGFloat
SKNodeSetYScale( SKNodeRef ref, CGFloat scale )
```

Related nodes

```
SKNodeScene( SKNodeRef ref ) = SKSceneRef
SKNodeParent( SKNodeRef ref ) = SKNodeRef
SKNodeChildren( SKNodeRef ref ) = CFArrayRef
```

Modify node tree

```
SKNodeAddChild( SKNodeRef ref, SKNodeRef child )
SKNodeInsertChild( SKNodeRef ref, SKNodeRef child, NSInteger index )
SKNodeIsEqualToNode( SKNodeRef ref, SKNodeRef otherNode ) = Boolean// macOS 10.11+
SKNodeMoveToParent( SKNodeRef ref, SKNodeRef parent )// macOS 10.11+
SKNodeRemoveFromParent( SKNodeRef ref )
SKNodeRemoveAllChildren( SKNodeRef ref )
SKNodeRemoveChildrenFromArray( SKNodeRef ref, CFArrayRef children )
SKNodeInParentHierarchy( SKNodeRef ref, SKNodeRef parent ) = Boolean
```

Accessing by name

```
SKNodeName( SKNodeRef ref ) = CFStringRef
SKNodeSetName( SKNodeRef ref, CFStringRef name )
SKNodeChildNodeWithName( SKNodeRef ref, CFStringRef name ) = SKNodeRef
```

```
SKNodeEnumerateChildNodesWithName
```

Callback:

```
local fn MyEnumerateChildNodesCallback( node as SKNodeRef, childNode as SKNodeRef, userData as ptr )
end fn// = _true // return _true to stop enumeration
```

```
SKNodeEnumerateChildNodesWithName( SKNodeRef ref, CFStringRef name, ptr callback, ptr userData )
```

```
SKNodeObjectForKeyedSubscript( SKNodeRef ref, CFStringRef name ) = CFArrayRef// macOS 10.10+
```

Visibility

```
SKNodeAlpha( SKNodeRef ref ) = CGFloat
SKNodeSetAlpha( SKNodeRef ref, CGFloat alpha )
SKNodeIsHidden( SKNodeRef ref ) = Boolean
SKNodeSetHidden( SKNodeRef ref, Boolean flag )
```

## Running actions

```
SKNodeRunAction( SKNodeRef ref, SKActionRef action )
```

SKNodeRunActionCompletion

Callback:

```
local fn MyRunActionCompletionCallback( node as SKNodeRef, action as SKActionRef, userData as ptr )  
end fn
```

```
SKNodeRunActionCompletion( SKNodeRef ref, SKActionRef action, ptr callback, ptr userData )
```

```
SKNodeRunActionWithKey( SKNodeRef ref, SKActionRef action, CFStringRef key )
```

```
SKNodeSpeed( SKNodeRef ref ) = CGFloat
```

```
SKNodeSetSpeed( SKNodeRef ref, CGFloat speed )
```

```
SKNodeIsPaused( SKNodeRef ref ) = Boolean
```

```
SKNodeSetPaused( SKNodeRef ref, Boolean flag )
```

```
SKNodeActionForKey( SKNodeRef ref, CFStringRef key ) = SKActionRef
```

```
SKNodeHasActions( SKNodeRef ref ) = Boolean
```

```
SKNodeRemoveAllActions( SKNodeRef ref )
```

```
SKNodeRemoveActionForKey( SKNodeRef ref, CFStringRef key )
```

## Physics behaviors

```
SKNodePhysicsBody( SKNodeRef ref ) = SKPhysicsBodyRef
```

```
SKNodeSetPhysicsBody( SKNodeRef ref, SKPhysicsBodyRef body )
```

## Constraining

```
SKNodeConstraints( SKNodeRef ref ) = CFArrayRef// macOS 10.10+
```

```
SKNodeSetConstraints( SKNodeRef ref, CFArrayRef constraints )// macOS 10.10+
```

```
SKNodeReachConstraints( SKNodeRef ref ) = SKReachConstraintsRef// macOS 10.10+
```

```
SKNodeSetReachConstraints( SKNodeRef ref, SKReachConstraintsRef constraints )// macOS 10.10+
```

## Collisions

```
SKNodeIntersectsNode( SKNodeRef ref, SKNodeRef otherNode ) = Boolean
```

## User input

```
SKNodeIsUserInteractionEnabled( SKNodeRef ref ) = Boolean
```

```
SKNodeSetUserInteractionEnabled( SKNodeRef ref, Boolean flag )
```

## Hit testing

```
SKNodeContainsPoint( SKNodeRef ref, CGPoint pt ) = Boolean
```

```
SKNodeNodeAtPoint( SKNodeRef ref, CGPoint pt ) = SKNodeRef
```

```
SKNodeNodesAtPoint( SKNodeRef ref, CGPoint pt ) = CFArrayRef
```

## Converting between coordinate systems

```
SKNodeConvertPointFromNode( SKNodeRef ref, CGPoint pt, SKNodeRef otherNode ) = CGPoint
```

```
SKNodeConvertPointToNode( SKNodeRef ref, CGPoint pt, SKNodeRef otherNode ) = CGPoint
```

## Custom data

```
SKNodeUserData( SKNodeRef ref ) = CFMutableDictionaryRef
```

```
SKNodeSetUserData( SKNodeRef ref, CFMutableDictionaryRef userData )
```

## Accessibility

```
SKNodeAccessibilityChildren( SKNodeRef ref ) = CFArrayRef// macOS 10.12+
```

```
SKNodeSetAccessibilityChildren( SKNodeRef ref, CFArrayRef children )// macOS 10.12+
```

```
SKNodeAccessibilityFrame( SKNodeRef ref ) = CGRect// macOS 10.12+
```

```
SKNodeSetAccessibilityFrame( SKNodeRef ref, CGRect frame )// macOS 10.12+
```

```
SKNodeAccessibilityHelp( SKNodeRef ref ) = CFStringRef// macOS 10.12+
```

```
SKNodeSetAccessibilityHelp( SKNodeRef ref, CFStringRef help )// macOS 10.12+
```

```
SKNodeAccessibilityLabel( SKNodeRef ref ) = CFStringRef// macOS 10.12+
```

```
SKNodeSetAccessibilityLabel( SKNodeRef ref, CFStringRef label )// macOS 10.12+
```

```
SKNodeAccessibilityParent( SKNodeRef ref ) = CFTypeRef// macOS 10.12+
```

```
SKNodeSetAccessibilityParent( SKNodeRef ref, CFTypeRef parent )// macOS 10.12+
```

```
SKNodeAccessibilityRole( SKNodeRef ref ) = CFStringRef// macOS 10.12+
```

```
SKNodeSetAccessibilityRole( SKNodeRef ref, CFStringRef role )// macOS 10.12+
```

```
SKNodeAccessibilityRoleDescription( SKNodeRef ref ) = CFStringRef// macOS 10.12+
```

```
SKNodeSetAccessibilityRoleDescription( SKNodeRef ref, CFStringRef description )// macOS 10.12+
```

```
SKNodeAccessibilitySubrole( SKNodeRef ref ) = CFStringRef// macOS 10.12+
```

```
SKNodeSetAccessibilitySubrole( SKNodeRef ref, CFStringRef subrole )// macOS 10.12+
```

```
SKNodeIsAccessibilityElement( SKNodeRef ref ) = Boolean// macOS 10.12+
```

```
SKNodeSetAccessibilityElement( SKNodeRef ref, Boolean flag )// macOS 10.12+
```

```
SKNodeIsAccessibilityEnabled( SKNodeRef ref ) = Boolean// macOS 10.12+
```

```
SKNodeSetAccessibilityEnabled( SKNodeRef ref, Boolean flag )// macOS 10.12+
```

```
SKNodeAccessibilityHitTest( SKNodeRef ref, CGPoint pt ) = CFTypeRef// macOS 10.12+
```

## NSEvent (SKNodeEvent)

```
SKNodeLocationInNode( SKNodeRef ref ) = CGPoint
```

## Apple documentation

[SKNode](#)



## SKPhysicsBody

### Functions

Create from shape

```
SKPhysicsBodyWithCircle( CGFloat radius ) = SKPhysicsBodyRef
SKPhysicsBodyWithCircleCenter( CGFloat radius, CGPoint pt ) = SKPhysicsBodyRef// macOS 10.10+
SKPhysicsBodyWithRectangle( CGSize size ) = SKPhysicsBodyRef
SKPhysicsBodyWithRectangleCenter( CGSize size, CGPoint pt ) = SKPhysicsBodyRef// macOS 10.10+
SKPhysicsBodyWithPolygon( CGPathRef path ) = SKPhysicsBodyRef
```

Create from texture

```
SKPhysicsBodyWithTexture( SKTextureRef texture, CGSize size ) = SKPhysicsBodyRef// macOS 10.10+
SKPhysicsBodyWithTextureAlphaThreshold( SKTextureRef texture, float alphaThreshold, CGSize size ) =
SKPhysicsBodyRef// macOS 10.10+
```

Create from collection of bodies

```
SKPhysicsBodyWithBodies( CFArrayRef bodies ) = SKPhysicsBodyRef// macOS 10.10+
```

Create edge-based

```
SKPhysicsBodyWithEdgeLoopFromRect( CGRect r ) = SKPhysicsBodyRef
SKPhysicsBodyWithEdgeFromPoint( CGPoint fromPt, CGPoint toPt ) = SKPhysicsBodyRef
SKPhysicsBodyWithEdgeLoopFromPath( CGPathRef path ) = SKPhysicsBodyRef
SKPhysicsBodyWithEdgeChainFromPath( CGPathRef path ) = SKPhysicsBodyRef
```

Forces

```
SKPhysicsBodyAffectedByGravity( SKPhysicsBodyRef ref ) = Boolean
SKPhysicsBodySetAffectedByGravity( SKPhysicsBodyRef ref, Boolean flag )
SKPhysicsBodyAllowsRotation( SKPhysicsBodyRef ref ) = Boolean
SKPhysicsBodySetAllowsRotation( SKPhysicsBodyRef ref, Boolean flag )
SKPhysicsBodyIsDynamic( SKPhysicsBodyRef ref ) = Boolean
SKPhysicsBodySetDynamic( SKPhysicsBodyRef ref, Boolean flag )
```

Physical properties

```
SKPhysicsBodyMass( SKPhysicsBodyRef ref ) = CGFloat
SKPhysicsBodySetMass( SKPhysicsBodyRef ref, CGFloat mass )
SKPhysicsBodyDensity( SKPhysicsBodyRef ref ) = CGFloat
SKPhysicsBodySetDensity( SKPhysicsBodyRef ref, CGFloat density )
SKPhysicsBodyArea( SKPhysicsBodyRef ref ) = CGFloat
SKPhysicsBodyFriction( SKPhysicsBodyRef ref ) = CGFloat
SKPhysicsBodySetFriction( SKPhysicsBodyRef ref, CGFloat friction )
SKPhysicsBodyRestitution( SKPhysicsBodyRef ref ) = CGFloat
SKPhysicsBodySetRestitution( SKPhysicsBodyRef ref, CGFloat restitution )
SKPhysicsBodyLinearDamping( SKPhysicsBodyRef ref ) = CGFloat
SKPhysicsBodySetLinearDamping( SKPhysicsBodyRef ref, CGFloat damping )
SKPhysicsBodyAngularDamping( SKPhysicsBodyRef ref ) = CGFloat
SKPhysicsBodySetAngularDamping( SKPhysicsBodyRef ref, CGFloat damping )
```

Collisions and contacts

```
SKPhysicsBodyCategoryBitMask( SKPhysicsBodyRef ref ) = UInt32
SKPhysicsBodySetCategoryBitMask( SKPhysicsBodyRef ref, UInt32 bitMask )
SKPhysicsBodyCollisionBitMask( SKPhysicsBodyRef ref ) = UInt32
SKPhysicsBodySetCollisionBitMask( SKPhysicsBodyRef ref, UInt32 bitMask )
SKPhysicsBodyUsesPreciseCollisionDetection( SKPhysicsBodyRef ref ) = Boolean
SKPhysicsBodySetUsesPreciseCollisionDetection( SKPhysicsBodyRef ref, Boolean flag )
SKPhysicsBodyContactTestBitMask( SKPhysicsBodyRef ref ) = UInt32
SKPhysicsBodySetContactTestBitMask( SKPhysicsBodyRef ref, UInt32 bitMask )
SKPhysicsBodyAllContactedBodies( SKPhysicsBodyRef ref ) = CFArrayRef
```

Forces and impulses

```
SKPhysicsBodyApplyForce( SKPhysicsBodyRef ref, CGVector force )
SKPhysicsBodyApplyTorque( SKPhysicsBodyRef ref, CGFloat torque )
SKPhysicsBodyApplyForceAtPoint( SKPhysicsBodyRef ref, CGVector force, CGPoint pt )
SKPhysicsBodyApplyImpulse( SKPhysicsBodyRef ref, CGVector impulse )
SKPhysicsBodyApplyAngularImpulse( SKPhysicsBodyRef ref, CGFloat impulse )
SKPhysicsBodyApplyImpulseAtPoint( SKPhysicsBodyRef ref, CGVector impulse, CGPoint pt )
```

Position and velocity

```
SKPhysicsBodyVelocity( SKPhysicsBodyRef ref ) = CGVector
SKPhysicsBodySetVelocity( SKPhysicsBodyRef ref, CGVector velocity )
SKPhysicsBodyAngularVelocity( SKPhysicsBodyRef ref ) = CGFloat
SKPhysicsBodySetAngularVelocity( SKPhysicsBodyRef ref, CGFloat velocity )
SKPhysicsBodyIsResting( SKPhysicsBodyRef ref ) = Boolean
```

**SKPhysicsBodySetResting( SKPhysicsBodyRef ref, Boolean flag )**

Node

**SKPhysicsBodyNode( SKPhysicsBodyRef ref ) = SKNodeRef**

Joints

**SKPhysicsBodyJoints( SKPhysicsBodyRef ref ) = CFArrayRef**

Fields

**SKPhysicsBodyFieldBitMask( SKPhysicsBodyRef ref ) = UInt32// macOS 10.10+**

**SKPhysicsBodySetFieldBitMask( SKPhysicsBodyRef ref, UInt32 bitMask )// macOS 10.10+**

**SKPhysicsBodyCharge( SKPhysicsBodyRef ref ) = CGFloat// macOS 10.10+**

**SKPhysicsBodySetCharge( SKPhysicsBodyRef ref, CGFloat charge )// macOS 10.10+**

Pinning to node parent

**SKPhysicsBodyPinned( SKPhysicsBodyRef ref ) = Boolean// macOS 10.10+**

**SKPhysicsBodySetPinned( SKPhysicsBodyRef ref, Boolean flag )// macOS 10.10+**

## Apple documentation

[SKPhysicsBody](#)





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## SKPhysicsContact

### Functions

Properties

```
SKPhysicsContactBodyA( SKPhysicsContactRef ref ) = SKPhysicsBodyRef
SKPhysicsContactBodyB( SKPhysicsContactRef ref ) = SKPhysicsBodyRef
SKPhysicsContactPoint( SKPhysicsContactRef ref ) = CGPoint
SKPhysicsContactCollisionImpulse( SKPhysicsContactRef ref ) = CGFloat
SKPhysicsContactNormal( SKPhysicsContactRef ref ) = CGVector// macOS 10.10+
```

### Apple documentation

[SKPhysicsContact](#)



---

## SKPhysicsJoint

### Functions

Bodies

```
SKPhysicsJointBodyA( SKPhysicsJointRef ref ) = SKPhysicsBodyRef  
SKPhysicsJointSetBodyA( SKPhysicsJointRef ref, SKPhysicsBodyRef body )  
SKPhysicsJointBodyB( SKPhysicsJointRef ref ) = SKPhysicsBodyRef  
SKPhysicsJointSetBodyB( SKPhysicsJointRef ref, SKPhysicsBodyRef body )
```

Stress and speed

```
SKPhysicsJointReactionForce( SKPhysicsJointRef ref ) = CGVector// macOS 10.10+  
SKPhysicsJointReactionTorque( SKPhysicsJointRef ref ) = CGFloat// macOS 10.10+
```

### Apple documentation

[SKPhysicsJoint](#)



---

## SKPhysicsJointFixed

### Functions

Create

```
SKPhysicsJointFixedWithBodyAB( SKPhysicsBodyRef bodyA, SKPhysicsBodyRef bodyB, CGPoint anchor ) =  
SKPhysicsJointFixedRef
```

### Apple documentation

[SKPhysicsJointFixed](#)



---

## SKPhysicsJointLimit

### Functions

Create

```
SKPhysicsJointLimitWithBodyAB( SKPhysicsBodyRef bodyA, SKPhysicsBodyRef bodyB, CGPoint anchorA, CGPoint anchorB ) = SKPhysicsJointLimitRef
```

Configure

```
SKPhysicsJointLimitMaxLength( SKPhysicsJointLimitRef ref ) = CGFloat  
SKPhysicsJointLimitSetMaxLength( SKPhysicsJointLimitRef ref, CGFloat length )
```

### Apple documentation

[SKPhysicsJointLimit](#)



---

## SKPhysicsJointPin

### Functions

Create

```
SKPhysicsJointPinWithBodyAB( SKPhysicsBodyRef bodyA, SKPhysicsBodyRef bodyB, CGPoint anchor ) = SKPhysicsJointPinRef
```

Configure

```
SKPhysicsJointPinRotationSpeed( SKPhysicsJointPinRef ref ) = CGFloat// macOS 10.10+
SKPhysicsJointPinSetRotationSpeed( SKPhysicsJointPinRef ref, CGFloat speed )// macOS 10.10+
SKPhysicsJointPinShouldEnableLimits( SKPhysicsJointPinRef ref ) = Boolean
SKPhysicsJointPinSetShouldEnableLimits( SKPhysicsJointPinRef ref, Boolean flag )
SKPhysicsJointPinLowerAngleLimit( SKPhysicsJointPinRef ref ) = CGFloat
SKPhysicsJointPinSetLowerAngleLimit( SKPhysicsJointPinRef ref, CGFloat limit )
SKPhysicsJointPinUpperAngleLimit( SKPhysicsJointPinRef ref ) = CGFloat
SKPhysicsJointPinSetUpperAngleLimit( SKPhysicsJointPinRef ref, CGFloat limit )
SKPhysicsJointPinFrictionTorque( SKPhysicsJointPinRef ref ) = CGFloat
SKPhysicsJointPinSetFrictionTorque( SKPhysicsJointPinRef ref, CGFloat torque )
```

### Apple documentation

[SKPhysicsJointPin](#)



---

## SKPhysicsJointSliding

### Functions

Create

```
SKPhysicsJointSlidingWithBodyAB( SKPhysicsBodyRef bodyA, SKPhysicsBodyRef bodyB, CGPoint anchor, CGVector axis ) = SKPhysicsJointSlidingRef
```

Configure

```
SKPhysicsJointSlidingShouldEnableLimits( SKPhysicsJointSlidingRef ref ) = Boolean  
SKPhysicsJointSlidingSetShouldEnableLimits( SKPhysicsJointSlidingRef ref, Boolean flag )  
SKPhysicsJointSlidingLowerDistanceLimit( SKPhysicsJointSlidingRef ref ) = CGFloat  
SKPhysicsJointSlidingSetLowerDistanceLimit( SKPhysicsJointSlidingRef ref, CGFloat limit )  
SKPhysicsJointSlidingUpperDistanceLimit( SKPhysicsJointSlidingRef ref ) = CGFloat  
SKPhysicsJointSlidingSetUpperDistanceLimit( SKPhysicsJointSlidingRef ref, CGFloat limit )
```

### Apple documentation

[SKPhysicsJointSliding](#)



### SKPhysicsJointSpring

#### Functions

Create

```
SKPhysicsJointSpringWithBodyAB( SKPhysicsBodyRef bodyA, SKPhysicsBodyRef bodyB, CGPoint anchorA, CGPoint anchorB ) = SKPhysicsJointSpringRef
```

Configure

```
SKPhysicsJointSpringDamping( SKPhysicsJointSlidingRef ref ) = CGFloat  
SKPhysicsJointSpringSetDamping( SKPhysicsJointSlidingRef ref, CGFloat damping )  
SKPhysicsJointSpringFrequency( SKPhysicsJointSlidingRef ref ) = CGFloat  
SKPhysicsJointSpringSetFrequency( SKPhysicsJointSlidingRef ref, CGFloat frequency )
```

#### Apple documentation

[SKPhysicsJointSpring](#)



## SKPhysicsWorld

### Delegate callback events

Event	Description
<code>_skPhysicsContactDidBegin</code>	Called when two bodies first contact each other.
<code>_skPhysicsContactDidEnd</code>	Called when the contact ends between two physical bodies.

### Functions

Configure

```
SKPhysicsWorldGravity( SKPhysicsWorldRef ref ) = CGVector
SKPhysicsWorldSetGravity( SKPhysicsWorldRef ref, CGVector gravity )
SKPhysicsWorldSpeed( SKPhysicsWorldRef ref ) = CGFloat
SKPhysicsWorldSetSpeed( SKPhysicsWorldRef ref, CGFloat speed )
```

Joints

```
SKPhysicsWorldAddJoint( SKPhysicsWorldRef ref, SKPhysicsJointRef joint )
SKPhysicsWorldRemoveAllJoints( SKPhysicsWorldRef ref )
SKPhysicsWorldRemoveJoint( SKPhysicsWorldRef ref, SKPhysicsJointRef joint )
```

Collisions

SKPhysicsWorldSetContactDelegateCallback

Callback:

```
local fn MyContactDelegateCallback( ev as long, contact as SKPhysicsContactRef, userData as ptr )
end fn
```

```
SKPhysicsWorldSetContactDelegateCallback( SKPhysicsWorldRef ref, ptr callback, ptr userData )
```

Searching scene for bodies

```
SKPhysicsWorldBodyAlongRay( SKPhysicsWorldRef ref, CGPoint startPt, CGPoint endPt ) = SKPhysicsBodyRef
SKPhysicsWorldBodyAtPoint( SKPhysicsWorldRef ref, CGPoint pt ) = SKPhysicsBodyRef
SKPhysicsWorldBodyInRect( SKPhysicsWorldRef ref, CGRect r ) = SKPhysicsBodyRef
```

SKPhysicsWorldEnumerateBodiesAlongRay

Callback:

```
local fn MyEnumerateBodiesAlongRayCallback( world as SKPhysicsWorldRef, body as SKPhysicsBodyRef, userData as ptr )
ptr )
end fn // = _true // return _true to stop enumeration
```

```
SKPhysicsWorldEnumerateBodiesAlongRay( SKPhysicsWorldRef ref, CGPoint startPt, CGPoint endPt, ptr callback, ptr userData )
```

SKPhysicsWorldEnumerateBodiesAtPoint

Callback:

```
local fn MyEnumerateBodiesAtPointCallback( world as SKPhysicsWorldRef, body as SKPhysicsBodyRef, userData as ptr )
)
end fn // = _true // return _true to stop enumeration
```

```
SKPhysicsWorldEnumerateBodiesAtPoint( SKPhysicsWorldRef ref, CGPoint pt, ptr callback, ptr userData )
```

SKPhysicsWorldEnumerateBodiesInRect

Callback:

```
local fn MyEnumerateBodiesInRectCallback( world as SKPhysicsWorldRef, body as SKPhysicsBodyRef, userData as ptr )
ptr )
end fn // = _true // return _true to stop enumeration
```

```
SKPhysicsWorldEnumerateBodiesInRect( SKPhysicsWorldRef ref, CGRect r, ptr callback, ptr userData )
```

Sampling fields

```
SKPhysicsWorldSampleFields( SKPhysicsWorldRef ref, vector_float3 position ) = vector_float3 // macOS 10.10+
```

### Apple documentation

[SKPhysicsWorld](#)





---

## SKRange

### Functions

Create

```
SKRangeWithLowerLimitUpperLimit( CGFloat lowerLimit, CGFloat upperLimit ) = SKRangeRef
SKRangeWithValue( CGFloat value, CGFloat variance ) = SKRangeRef
SKRangeWithNoLimits = SKRangeRef
SKRangeWithLowerLimit( CGFloat lowerLimit ) = SKRangeRef
SKRangeWithUpperLimit( CGFloat upperLimit ) = SKRangeRef
SKRangeWithConstantValue( CGFloat value ) = SKRangeRef
```

Inspect

```
SKRangeLowerLimit( SKRangeRef ref ) = CGFloat
SKRangeSetLowerLimit( SKRangeRef ref, CGFloat lowerLimit )
SKRangeUpperLimit( SKRangeRef ref ) = CGFloat
SKRangeSetUpperLimit( SKRangeRef ref, CGFloat upperLimit )
```

### Apple documentation

[SKRange](#)



---

## SKReachConstraints

### Functions

Create

```
SKReachConstraintsWithAngleLimits( CGFloat lowerAngleLimit, CGFloat upperAngleLimit ) = SKReachConstraintsRef
```

Angle limits

```
SKReachConstraintsLowerAngleLimit( SKReachConstraintsRef ref ) = CGFloat
```

```
SKReachConstraintsSetLowerAngleLimit( SKReachConstraintsRef ref, CGFloat angleLimit )
```

```
SKReachConstraintsUpperAngleLimit( SKReachConstraintsRef ref ) = CGFloat
```

```
SKReachConstraintsSetUpperAngleLimit( SKReachConstraintsRef ref, CGFloat angleLimit )
```

### Apple documentation

[SKReachConstraints](#)



---

## SKReferenceNode

### Functions

Init

```
SKReferenceNodeWithURL( CFURLRef url ) = SKReferenceNodeRef  
SKReferenceNodeWithFileNamed( CFStringRef name ) = SKReferenceNodeRef  
SKReferenceNodeWithCoder( NSCoderRef coder ) = SKReferenceNodeRef
```

Regenerating

```
SKReferenceNodeResolve( SKReferenceNodeRef ref )
```

Loading

```
SKReferenceNodeDidLoad( SKReferenceNodeRef ref, SKNodeRef node )
```

### Apple documentation

[SKReferenceNode](#)



---

## SKRegion

### Functions

Create

```
SKRegionInfinite = SKRegionRef
SKRegionWithSize( CGSize size ) = SKRegionRef
SKRegionWithRadius( float radius ) = SKRegionRef
SKRegionWithPath( CGPathRef path ) = SKRegionRef
SKRegionInverse( SKRegionRef ref ) = SKRegionRef
SKRegionByDifferenceFromRegion( SKRegionRef ref, SKRegionRef otherRegion ) = SKRegionRef
SKRegionByIntersectionWithRegion( SKRegionRef ref, SKRegionRef otherRegion ) = SKRegionRef
SKRegionByUnionWithRegion( SKRegionRef ref, SKRegionRef otherRegion ) = SKRegionRef
```

Interacting

```
SKRegionPath( SKRegionRef ref ) = CGPathRef
SKRegionContainsPoint( SKRegionRef ref, CGPoint pt ) = Boolean
```

### Apple documentation

[SKRegion](#)



---

## SKRenderer

### Functions

First steps

```
SKRendererScene( SKRendererRef ref ) = SKSceneRef  
SKRendererSetScene( SKRendererRef ref, SKSceneRef scene )
```

Scene update cycle

```
SKRendererUpdateAtTime( SKRendererRef ref, CTimeInterval currentTime )
```

Performance related toggles

```
SKRendererIgnoresSiblingOrder( SKRendererRef ref ) = Boolean  
SKRendererSetIgnoresSiblingOrder( SKRendererRef ref, Boolean flag )  
SKRendererShouldCullNonVisibleNodes( SKRendererRef ref ) = Boolean  
SKRendererSetShouldCullNonVisibleNodes( SKRendererRef ref, Boolean flag )
```

Visual statistics for debugging

```
SKRendererShowsNodeCount( SKRendererRef ref ) = Boolean  
SKRendererSetShowsNodeCount( SKRendererRef ref, Boolean flag )  
SKRendererShowsDrawCount( SKRendererRef ref ) = Boolean  
SKRendererSetShowsDrawCount( SKRendererRef ref, Boolean flag )  
SKRendererShowsQuadCount( SKRendererRef ref ) = Boolean  
SKRendererSetShowsQuadCount( SKRendererRef ref, Boolean flag )  
SKRendererShowsPhysics( SKRendererRef ref ) = Boolean  
SKRendererSetShowsPhysics( SKRendererRef ref, Boolean flag )  
SKRendererShowsFields( SKRendererRef ref ) = Boolean  
SKRendererSetShowsFields( SKRendererRef ref, Boolean flag )
```

### Apple documentation

[SKRenderer](#)



## SKScene

### Delegate callback events

Event	Description
<code>_skSceneUpdate</code>	Tells you to perform any app specific logic to update your scene.
<code>_skSceneDidEvaluateActions</code>	Tells you to perform any necessary logic after scene actions are evaluated.
<code>_skSceneDidSimulatePhysics</code>	Tells you to perform any necessary logic after physics simulations are performed.
<code>_skSceneDidApplyConstraints</code>	Tells you to perform any necessary logic after constraints are applied.
<code>_skSceneDidFinishUpdate</code>	Tells you to perform any necessary logic after the scene has finished all of the steps required to process animations.

### Functions

Create

```
SKSceneWithSize( CGSize size ) = SKSceneRef
SKSceneSize( SKSceneRef ref ) = CGSize
SKSceneSetSize( SKSceneRef ref, CGSize size )
```

Stretch content to fit view

```
SKSceneScaleMode( SKSceneRef ref ) = SKSceneScaleMode
SKSceneSetScaleMode( SKSceneRef ref, SKSceneScaleMode scaleMode )
```

Configure Viewport

```
SKSceneCamera( SKSceneRef ref ) = SKCameraNodeRef// macOS 10.11+
SKSceneSetCamera( SKSceneRef ref, SKCameraNodeRef camera )// macOS 10.11+
SKSceneAnchorPoint( SKSceneRef ref ) = CGPoint
SKSceneSetAnchorPoint( SKSceneRef ref, CGPoint pt )
```

Configure delegate

```
SKSceneSetDelegateCallback
```

Callback:

```
local fn MySceneDelegateCallback( ev as long, scene as SKSceneRef, currentTime as CFTimeInterval, userData as ptr )
end fn
```

```
SKSceneSetDelegateCallback( SKSceneRef ref, ptr callback, ptr userData )// macOS 10.10+
```

Background appearance

```
SKSceneView( SKSceneRef ref ) = NSInteger// returns view tag
SKSceneBackgroundColor( SKSceneRef ref ) = ColorRef
SKSceneSetBackgroundColor( SKSceneRef ref, ColorRef col )
```

Physics properties

```
SKScenePhysicsWorld( SKSceneRef ref ) = SKPhysicsWorldRef
```

Positional audio

```
SKSceneListener( SKSceneRef ref ) = SKNodeRef// macOS 10.11+
SKSceneSetListener( SKSceneRef ref, SKNodeRef listener )// macOS 10.11+
//SKSceneAudioEngine( SKSceneRef ref ) = AVAAudioEngineRef// macOS 10.11+
```

Converting between coordinate systems

```
SKSceneConvertPointFromView( SKSceneRef ref, CGPoint pt ) = CGPoint
SKSceneConvertPointToView( SKSceneRef ref, CGPoint pt ) = CGPoint
```

### Apple documentation

[SKScene](#)



---

## SKShader

### Functions

Create

```
SKShaderInit = SKShaderRef// autoreleased
SKShaderWithFileNamed( CFStringRef name ) = SKShaderRef
SKShaderWithSource( CFStringRef source ) = SKShaderRef
SKShaderWithSourceUniforms( CFStringRef source, CFArrayRef uniforms ) = SKShaderRef
```

Uniform

```
SKShaderAddUniform( SKShaderRef ref, SKUniformRef uniform )
SKShaderRemoveUniformNamed( SKShaderRef ref, CFStringRef name )
SKShaderUniforms( SKShaderRef ref ) = CFArrayRef
SKShaderSetUniforms( SKShaderRef ref, CFArrayRef uniforms )
SKShaderUniformNamed( SKShaderRef ref, CFStringRef name ) = SKUniformRef
```

Attribute

```
SKShaderAttributes( SKShaderRef ref ) = CFArrayRef// macOS 10.12+
SKShaderSetAttributes( SKShaderRef ref, CFArrayRef attributes )// macOS 10.12+
```

Source code

```
SKShaderSource( SKShaderRef ref ) = CFStringRef
SKShaderSetSource( SKShaderRef ref, CFStringRef source )
```

### Apple documentation

[SKShader](#)



## SKShapeNode

### Functions

Create from path

```
SKShapeNodeWithPath( CGContext path ) = SKShapeNodeRef// macOS 10.10+
SKShapeNodeWithPathCentered( CGContext path, Boolean centered ) = SKShapeNodeRef// macOS 10.10+
SKShapeNodePath( SKShapeNodeRef ref ) = CGContext
SKShapeNodeSetPath( SKShapeNodeRef ref, CGContext path )
```

Create from rectangle

```
SKShapeNodeWithRect( CGRect r ) = SKShapeNodeRef// macOS 10.10+
SKShapeNodeWithRectOfSize( CGSize size ) = SKShapeNodeRef// macOS 10.10+
SKShapeNodeWithRectCornerRadius( CGRect r, CGFloat radius ) = SKShapeNodeRef// macOS 10.10+
SKShapeNodeWithRectOfSizeCornerRadius( CGSize size, CGFloat radius ) = SKShapeNodeRef// macOS 10.10+
```

Create circle shape

```
SKShapeNodeWithCircleOfRadius( CGFloat radius ) = SKShapeNodeRef// macOS 10.10+
```

Create ellipse shape

```
SKShapeNodeWithEllipseOfSize( CGSize size ) = SKShapeNodeRef// macOS 10.10+
SKShapeNodeWithEllipseInRect( CGRect r ) = SKShapeNodeRef// macOS 10.10+
```

Create from array of points

```
SKShapeNodeWithPoints( CGPoint *size, long count ) = SKShapeNodeRef// macOS 10.10+
SKShapeNodeWithSplinePoints( CGPoint *size, long count ) = SKShapeNodeRef// macOS 10.10+
```

Fill

```
SKShapeNodeFillColor( SKShapeNodeRef ref ) = ColorRef
SKShapeNodeSetFillColor( SKShapeNodeRef ref, ColorRef col )
SKShapeNodeFillTexture( SKShapeNodeRef ref ) = SKTextureRef// macOS 10.10+
SKShapeNodeSetFillTexture( SKShapeNodeRef ref, SKTextureRef texture )// macOS 10.10+
```

Stroke

```
SKShapeNodeLineWidth( SKShapeNodeRef ref ) = CGFloat
SKShapeNodeSetLineWidth( SKShapeNodeRef ref, CGFloat lineWidth )
SKShapeNodeStrokeColor( SKShapeNodeRef ref ) = ColorRef
SKShapeNodeSetStrokeColor( SKShapeNodeRef ref, ColorRef col )
SKShapeNodeStrokeTexture( SKShapeNodeRef ref ) = SKTextureRef// macOS 10.10+
SKShapeNodeSetStrokeTexture( SKShapeNodeRef ref, SKTextureRef texture )// macOS 10.10+
SKShapeNodeGlowWidth( SKShapeNodeRef ref ) = CGFloat
SKShapeNodeSetGlowWidth( SKShapeNodeRef ref, CGFloat glowWidth )
SKShapeNodeLineCap( SKShapeNodeRef ref ) = CGLineCap// macOS 10.10+
SKShapeNodeSetLineCap( SKShapeNodeRef ref, CGLineCap lineCap )// macOS 10.10+
SKShapeNodeLineJoin( SKShapeNodeRef ref ) = CGLineJoin// macOS 10.10+
SKShapeNodeSetLineJoin( SKShapeNodeRef ref, CGLineJoin lineJoin )// macOS 10.10+
SKShapeNodeMiterLimit( SKShapeNodeRef ref ) = CGFloat// macOS 10.10+
SKShapeNodeSetMiterLimit( SKShapeNodeRef ref, CGFloat miterLimit )// macOS 10.10+
SKShapeNodeIsAntialiased( SKShapeNodeRef ref ) = Boolean
SKShapeNodeSetAntialiased( SKShapeNodeRef ref, Boolean flag )
```

Alpha blending

```
SKShapeNodeBlendMode( SKShapeNodeRef ref ) = SKBlendMode
SKShapeNodeSetBlendMode( SKShapeNodeRef ref, SKBlendMode mode )
```

Stroke length

```
SKShapeNodeLineLength( SKShapeNodeRef ref ) = CGFloat// macOS 10.10+
```

Customizing stroke or fill drawing

```
SKShapeNodeStrokeShader( SKShapeNodeRef ref ) = SKShaderRef// macOS 10.10+
SKShapeNodeSetStrokeShader( SKShapeNodeRef ref, SKShaderRef shader )// macOS 10.10+
SKShapeNodeFillShader( SKShapeNodeRef ref ) = SKShaderRef// macOS 10.10+
SKShapeNodeSetFillShader( SKShapeNodeRef ref, SKShaderRef shader )// macOS 10.10+
SKShapeNodeAttributeValues( SKShapeNodeRef ref ) = CFDictionaryRef// macOS 10.12+
SKShapeNodeSetAttributeValues( SKShapeNodeRef ref, CFDictionaryRef values )// macOS 10.12+
SKShapeNodeSetValueForAttributeNamed( SKShapeNodeRef ref, SKAttributeRef value, CFStringRef key )// macOS 10.12+
SKShapeNodeValueForAttributeNamed( SKShapeNodeRef ref, CFStringRef key ) = SKAttributeRef// macOS 10.12+
```

### Apple documentation

[SKShapeNode](#)





## SKSpriteNode

### Functions

Create from filename

```
SKSpriteNodeWithImageNamed( CFStringRef name ) = SKSpriteNodeRef
SKSpriteNodeWithNormalMapped( CFStringRef name, Boolean normalMapped ) = SKSpriteNodeRef// macOS 10.10+
```

Create from texture

```
SKSpriteNodeWithColor( ColorRef col, CGSize size ) = SKSpriteNodeRef
SKSpriteNodeWithTexture( SKTextureRef texture ) = SKSpriteNodeRef
SKSpriteNodeWithTextureSize( SKTextureRef texture, CGSize size ) = SKSpriteNodeRef
SKSpriteNodeWithTextureNormalMap( SKTextureRef texture, SKTextureRef normalMap ) = SKSpriteNodeRef// macOS 10.10+
SKSpriteNodeTexture( SKSpriteNodeRef ref ) = SKTextureRef
SKSpriteNodeSetTexture( SKSpriteNodeRef ref, SKTextureRef texture )
```

Create from archive

```
SKSpriteNodeWithCoder( CoderRef coder ) = SKSpriteNodeRef
```

Size and position

```
SKSpriteNodeSize( SKSpriteNodeRef ref ) = CGSize
SKSpriteNodeSetSize( SKSpriteNodeRef ref, CGSize size )
SKSpriteNodeScaleToSize( SKSpriteNodeRef ref, CGSize size )// macOS 10.12+
SKSpriteNodeAnchorPoint( SKSpriteNodeRef ref ) = CGPoint
SKSpriteNodeSetAnchorPoint( SKSpriteNodeRef ref, CGPoint pt )
```

Scaling in nine parts

```
SKSpriteNodeCenterRect( SKSpriteNodeRef ref ) = CGRect
SKSpriteNodeSetCenterRect( SKSpriteNodeRef ref, CGRect r )
```

Tint

```
SKSpriteNodeColor( SKSpriteNodeRef ref ) = ColorRef
SKSpriteNodeSetColor( SKSpriteNodeRef ref, ColorRef col )
SKSpriteNodeColorBlendFactor( SKSpriteNodeRef ref ) = CGFloat
SKSpriteNodeSetColorBlendFactor( SKSpriteNodeRef ref, CGFloat factor )
```

Alpha blending

```
SKSpriteNodeBlendMode( SKSpriteNodeRef ref ) = SKBlendMode
SKSpriteNodeSetBlendMode( SKSpriteNodeRef ref, SKBlendMode mode )
```

Lighting

```
SKSpriteNodeLightingBitMask( SKSpriteNodeRef ref ) = UInt32// macOS 10.10+
SKSpriteNodeSetLightingBitMask( SKSpriteNodeRef ref, UInt32 bitMask )// macOS 10.10+
SKSpriteNodeShadowedBitMask( SKSpriteNodeRef ref ) = UInt32// macOS 10.10+
SKSpriteNodeSetShadowedBitMask( SKSpriteNodeRef ref, UInt32 bitMask )// macOS 10.10+
SKSpriteNodeShadowCastBitMask( SKSpriteNodeRef ref ) = UInt32// macOS 10.10+
SKSpriteNodeSetShadowCastBitMask( SKSpriteNodeRef ref, UInt32 bitMask )// macOS 10.10+
SKSpriteNodeNormalTexture( SKSpriteNodeRef ref ) = SKTextureRef// macOS 10.10+
SKSpriteNodeSetNormalTexture( SKSpriteNodeRef ref, SKTextureRef texture )// macOS 10.10+
```

Custom shader

```
SKSpriteNodeShader( SKSpriteNodeRef ref ) = SKShaderRef// macOS 10.10+
SKSpriteNodeSetShader( SKSpriteNodeRef ref, SKShaderRef shader )// macOS 10.10+
SKSpriteNodeAttributeValues( SKSpriteNodeRef ref ) = CFDictionaryRef// macOS 10.12+
SKSpriteNodeSetAttributeValues( SKSpriteNodeRef ref, CFDictionaryRef values )// macOS 10.12+
SKSpriteNodeSetValueForAttributeNamed( SKSpriteNodeRef ref, SKAttributeRef value, CFStringRef key )// macOS 10.12+
SKSpriteNodeValueForAttributeNamed( SKSpriteNodeRef ref, CFStringRef key ) = SKAttributeRef// macOS 10.12+
```

### Apple documentation

[SKSpriteNode](#)



## SKTexture

### Functions

Filename

```
SKTextureWithImageNamed( CFStringRef name ) = SKTextureRef
```

Texture within texture

```
SKTextureWithRectInTexture( CGRect r, SKTextureRef texture ) = SKTextureRef
```

Image

```
SKTextureWithImage( ImageRef image ) = SKTextureRef
```

```
SKTextureWithCGImage( CGImageRef image ) = SKTextureRef
```

Effects

```
SKTextureByApplyingCIFilter( SKTextureRef ref, CIFilterRef filter ) = SKTextureRef
```

Data

```
SKTextureWithData( CFDataRef dta, CGSize size ) = SKTextureRef
```

```
SKTextureWithDataRowLength( CFDataRef dta, CGSize size, UInt32 rowLength, UInt32 alignment ) = SKTextureRef
```

```
SKTextureWithDataFlipped( CFDataRef dta, CGSize size, Boolean flipped ) = SKTextureRef// macOS 10.10+
```

Normal map

```
SKTextureByGeneratingNormalMap( SKTextureRef ref ) = SKTextureRef// macOS 10.10+
```

```
SKTextureByGeneratingNormalMapWithSmoothness( SKTextureRef ref, CGFloat smoothness, CGFloat contrast ) =
```

```
SKTextureRef// macOS 10.10+
```

Noise textures

```
SKTextureVectorNoise( CGFloat smoothness, CGSize size ) = SKTextureRef// macOS 10.10+
```

```
SKTextureNoise( CGFloat smoothness, CGSize size, Boolean grayscale ) = SKTextureRef// macOS 10.10+
```

Size

```
SKTextureSize( SKTextureRef ref ) = CGSize
```

```
SKTextureRect( SKTextureRef ref ) = CGRect
```

Scaling behavior

```
SKTextureFilteringMode( SKTextureRef ref ) = SKTextureFilteringMode
```

```
SKTextureSetFilteringMode( SKTextureRef ref, SKTextureFilteringMode mode )
```

```
SKTextureUsesMipmaps( SKTextureRef ref ) = Boolean
```

```
SKTextureSetUsesMipmaps( SKTextureRef ref, Boolean flag )
```

Image

```
SKTextureCGImage( SKTextureRef ref ) = CGImageRef// macOS 10.11+
```

Preload

SKTexturePreload

Callback:

```
local fn MyTexturePreloadCallback( ref as SKTextureRef, userData as ptr )
end fn
```

```
SKTexturePreload( SKTextureRef Ref, ptr callback, ptr userData )
```

SKTexturePreloadTextures

Callback:

```
local fn MyPreloadTexturesCallback( userData as ptr )
end fn
```

```
SKTexturePreloadTextures( CFArrayRef textures, ptr callback, ptr userData )
```

### Apple documentation

[SKTexture](#)



---

## SKTextureAtlas

### Functions

Create

```
SKTextureAtlasNamed( CFStringRef name ) = SKTextureAtlasRef
SKTextureAtlasWithDictionary( CFDictionaryRef dict ) = SKTextureAtlasRef // macOS 10.10+
```

Textures

```
SKTextureAtlasTextureNamed( SKTextureAtlasRef ref, CFStringRef name ) = SKTextureRef
```

Preload

SKTextureAtlasPreload

Callback:

```
local fn MyTextureAtlasPreloadCallback( ref as SKTextureAtlasRef, userData as ptr )
end fn
```

```
SKTextureAtlasPreload( SKTextureRef ref, ptr callback, ptr userData )
```

SKTextureAtlasPreloadAtlases

Callback:

```
local fn MyPreloadAtlasesCallback( userData as ptr )
end fn
```

```
SKTextureAtlasPreloadAtlases( CFArrayRef textureAtlases, ptr callback, ptr userData )
```

SKTextureAtlasPreloadNamed

Callback:

```
local fn MyTextureAtlasPreloadNamedCallback( err as ErrorRef, foundAtlases as CFArrayRef, userData as ptr )
end fn
```

```
SKTextureAtlasPreloadNamed( CFArrayRef textureAtlasNames, ptr callback, ptr userData ) // macOS 10.11+
```

Filenames

```
SKTextureAtlasTextureNames( SKTextureAtlasRef ref ) = CFArrayRef
```

### Apple documentation

[SKTextureAtlas](#)



## SKTileDefinition

---

### Functions

Create

```
SKTileDefinitionWithTexture( SKTextureRef texture ) = SKTileDefinitionRef
SKTileDefinitionWithNormalTexture( SKTextureRef texture, SKTextureRef normalTexture, CGSize size ) =
SKTileDefinitionRef
SKTileDefinitionWithSize( SKTextureRef texture, CGSize size ) = SKTileDefinitionRef
SKTileDefinitionWithNormalTextures( CFArrayRef textures, CFArrayRef normalTextures, CGSize size, CGFloat
timePerFrame ) = SKTileDefinitionRef
SKTileDefinitionWithTextures( CFArrayRef textures, CGSize size, CGFloat timePerFrame ) = SKTileDefinitionRef
```

Flip

```
SKTileDefinitionFlipHorizontally( SKTileDefinitionRef ref ) = Boolean
SKTileDefinitionSetFlipHorizontally( SKTileDefinitionRef ref, Boolean flag )
SKTileDefinitionFlipVertically( SKTileDefinitionRef ref ) = Boolean
SKTileDefinitionSetFlipVertically( SKTileDefinitionRef ref, Boolean flag )
```

Rotate

```
SKTileDefinitionRotation( SKTileDefinitionRef ref ) = SKTileDefinitionRotation
SKTileDefinitionSetRotation( SKTileDefinitionRef ref, SKTileDefinitionRotation rotation )
```

Animated tile properties

```
SKTileDefinitionTextures( SKTileDefinitionRef ref ) = CFArrayRef
SKTileDefinitionSetTextures( SKTileDefinitionRef ref, CFArrayRef textures )
SKTileDefinitionNormalTextures( SKTileDefinitionRef ref ) = CFArrayRef
SKTileDefinitionSetNormalTextures( SKTileDefinitionRef ref, CFArrayRef textures )
SKTileDefinitionTimePerFrame( SKTileDefinitionRef ref ) = CGFloat
SKTileDefinitionSetTimePerFrame( SKTileDefinitionRef ref, CGFloat timePerFrame )
```

Custom data

```
SKTileDefinitionUserData( SKTileDefinitionRef ref ) = CFDictionaryRef
SKTileDefinitionSetUserData( SKTileDefinitionRef ref, CFDictionaryRef userData )
```

Properties

```
SKTileDefinitionName( SKTileDefinitionRef ref ) = CFStringRef
SKTileDefinitionSetName( SKTileDefinitionRef ref, CFStringRef name )
SKTileDefinitionPlacementWeight( SKTileDefinitionRef ref ) = NSUInteger
SKTileDefinitionSetPlacementWeight( SKTileDefinitionRef ref, NSUInteger weight )
SKTileDefinitionSize( SKTileDefinitionRef ref ) = CGSize
SKTileDefinitionSetSize( SKTileDefinitionRef ref, CGSize size )
```

### Apple documentation

[SKTileDefinition](#)



---

## SKTileGroup

### Functions

Create

```
SKTileGroupEmpty = SKTileGroupRef // create an empty tile  
SKTileGroupWithTileDefinition( SKTileDefinitionRef definition ) = SKTileGroupRef  
SKTileGroupWithRules( CFArrayRef rules ) = SKTileGroupRef
```

Properties

```
SKTileGroupName( SKTileGroupRef ref ) = CFStringRef  
SKTileGroupSetName( SKTileGroupRef ref, CFStringRef name )  
SKTileGroupRules( SKTileGroupRef ref ) = CFArrayRef  
SKTileGroupSetRules( SKTileGroupRef ref, CFArrayRef rules )
```

### Apple documentation

[SKTileGroup](#)



---

## SKTileGroupRule

### Functions

Create

```
SKTileGroupRuleWithAdjacency( SKTileAdjacencyMask mask, CFArrayRef tileDefinitions ) = SKTileGroupRuleRef
```

Properties

```
SKTileGroupRuleAdjacency( SKTileGroupRuleRef ref ) = SKTileAdjacencyMask
```

```
SKTileGroupRuleSetAdjacency( SKTileGroupRuleRef ref, SKTileAdjacencyMask mask )
```

```
SKTileGroupRuleName( SKTileGroupRuleRef ref ) = CFStringRef
```

```
SKTileGroupRuleSetName( SKTileGroupRuleRef ref, CFStringRef name )
```

```
SKTileGroupRuleTileDefinitions( SKTileGroupRuleRef ref ) = CFArrayRef
```

```
SKTileGroupRuleSetTileDefinitions( SKTileGroupRuleRef ref, CFArrayRef definitions )
```

### Apple documentation

[SKTileGroupRule](#)



## SKTileMapNode

### Functions

#### Create

```
SKTileMapNodeWithTileSet( SKTileSetRef tileSet, NSUInteger columns, NSUInteger rows, CGSize tileSize ) =  
SKTileMapNodeRef  
SKTileMapNodeWithTileSetFillWithTileGroup( SKTileSetRef tileSet, NSUInteger columns, NSUInteger rows, CGSize  
tileSize, SKTileGroupRef group ) = SKTileMapNodeRef  
SKTileMapNodeWithTileSetFillWithTileGroupLayout( SKTileSetRef tileSet, NSUInteger columns, NSUInteger rows, CGSize  
tileSize, CFArrayRef tileGroupLayout ) = SKTileMapNodeRef
```

#### Contents

```
SKTileMapNodeEnableAutomapping( SKTileMapNodeRef ref ) = Boolean  
SKTileMapNodeSetEnableAutomapping( SKTileMapNodeRef ref, Boolean flag )  
SKTileMapNodeFillWithTileGroup( SKTileMapNodeRef ref, SKTileGroupRef tileGroup )  
SKTileMapNodeSetTitleGroupAndDefinition( SKTileMapNodeRef ref, SKTileGroupRef tileGroup, SKTileDefinitionRef  
tileDefinition, NSUInteger column, NSUInteger row )  
SKTileMapNodeSetTitleGroup( SKTileMapNodeRef ref, SKTileGroupRef tileGroup, NSUInteger column, NSUInteger row )
```

#### Position

```
SKTileMapNodeAnchorPoint( SKTileMapNodeRef ref ) = CGPoint  
SKTileMapNodeSetAnchorPoint( SKTileMapNodeRef ref, CGPoint pt )
```

#### Size

```
SKTileMapNodeTileSize( SKTileMapNodeRef ref ) = CGSize  
SKTileMapNodeSetTitleSize( SKTileMapNodeRef ref, CGSize size )  
SKTileMapNodeSetTitleSet( SKTileMapNodeRef ref ) = SKTileSetRef  
SKTileMapNodeSetTitleSet( SKTileMapNodeRef ref, SKTileSetRef tileSet )  
SKTileMapNodeNumberOfColumns( SKTileMapNodeRef ref ) = NSUInteger  
SKTileMapNodeSetNumberOfColumns( SKTileMapNodeRef ref, NSUInteger numberOfColumns )  
SKTileMapNodeNumberOfRows( SKTileMapNodeRef ref ) = NSUInteger  
SKTileMapNodeSetNumberOfRows( SKTileMapNodeRef ref, NSUInteger numberOfRows )
```

#### Properties

```
SKTileMapNodeCenterOfTile( SKTileMapNodeRef ref, NSUInteger column, NSUInteger row ) = CGPoint  
SKTileMapNodeTileColumnIndexFromPosition( SKTileMapNodeRef ref, CGPoint position ) = NSUInteger  
SKTileMapNodeTileDefinition( SKTileMapNodeRef ref, NSUInteger column, NSUInteger row ) = SKTileDefinitionRef  
SKTileMapNodeTileGroup( SKTileMapNodeRef ref, NSUInteger column, NSUInteger row ) = SKTileGroupRef  
SKTileMapNodeTileRowIndexFromPosition( SKTileMapNodeRef ref, CGPoint position ) = NSUInteger  
SKTileMapNodeMapSize( SKTileMapNodeRef ref ) = CGSize
```

#### Tinting

```
SKTileMapNodeColor( SKTileMapNodeRef ref ) = ColorRef  
SKTileMapNodeSetColor( SKTileMapNodeRef ref, ColorRef col )  
SKTileMapNodeColorBlendFactor( SKTileMapNodeRef ref ) = CGFloat  
SKTileMapNodeSetColorBlendFactor( SKTileMapNodeRef ref, CGFloat factor )
```

#### Lighting

```
SKTileMapNodeLightingBitMask( SKTileMapNodeRef ref ) = UInt32  
SKTileMapNodeSetLightingBitMask( SKTileMapNodeRef ref, UInt32 bitMask )
```

#### Alpha

```
SKTileMapNodeBlendMode( SKTileMapNodeRef ref ) = SKBlendMode  
SKTileMapNodeSetBlendMode( SKTileMapNodeRef ref, SKBlendMode mode )
```

#### Shader

```
SKTileMapNodeShader( SKTileMapNodeRef ref ) = SKShaderRef  
SKTileMapNodeSetShader( SKTileMapNodeRef ref, SKShaderRef shader )  
SKTileMapNodeAttributeValues( SKTileMapNodeRef ref ) = CFDictionaryRef  
SKTileMapNodeSetAttributeValues( SKTileMapNodeRef ref, CFDictionaryRef values )  
SKTileMapNodeSetValueForAttributeNamed( SKTileMapNodeRef ref, SKAttributeValueRef value, CFStringRef key )  
SKTileMapNodeValueForAttributeNamed( SKTileMapNodeRef ref, CFStringRef key ) = SKAttributeValueRef
```

### Apple documentation

[SKTileMapNode](#)



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## SKTileSet

### Functions

Create

```
SKTileSetNamed( CFStringRef name ) = SKTileSetRef
SKTileSetFromURL( CFURLRef url ) = SKTileSetRef
SKTileSetWithTileGroups( CFArrayRef tileGroups ) = SKTileSetRef
SKTileSetWithTileGroupsType( CFArrayRef tileGroups, SKTileSetType type ) = SKTileSetRef
```

Properties

```
SKTileSetDefaultTileGroup( SKTileSetRef ref ) = SKTileGroupRef
SKTileSetSetDefaultTileGroup( SKTileSetRef ref, SKTileGroupRef group )
SKTileSetDefaultTileSize( SKTileSetRef ref ) = CGSize
SKTileSetSetDefaultTileSize( SKTileSetRef ref, CGSize size )
SKTileSetName( SKTileSetRef ref ) = CFStringRef
SKTileSetSetName( SKTileSetRef ref, CFStringRef name )
SKTileSetTileGroups( SKTileSetRef ref ) = CFArrayRef
SKTileSetSetTileGroups( SKTileSetRef ref, CFArrayRef groups )
skTileSetType( SKTileSetRef ref ) = SKTileSetType// lowercase 'sk' to avoid conflict with type name
SKTileSetSetType( SKTileSetRef ref, SKTileSetType type )
```

### Apple documentation

[SKTileSet](#)





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## SKTransformNode

### Functions

Rotate child nodes

```
SKTransformNodeXRotation( SKTransformNodeRef ref ) = CGFloat
SKTransformNodeSetXRotation( SKTransformNodeRef ref, CGFloat rotation )
SKTransformNodeYRotation( SKTransformNodeRef ref ) = CGFloat
SKTransformNodeSetYRotation( SKTransformNodeRef ref, CGFloat rotation )

SKTransformNodeSetEulerAngles( SKTransformNodeRef ref, vector_float3 euler )
SKTransformNodeSetQuaternion( SKTransformNodeRef ref, simd_quatf quaternion )
SKTransformNodeSetRotationMatrix( SKTransformNodeRef ref, matrix_float3x3 matrix )
```

Current rotation

```
SKTransformNodeEulerAngles( SKTransformNodeRef ref ) = vector_float3
SKTransformNodeQuaternion( SKTransformNodeRef ref ) = simd_quatf
SKTransformNodeSetEulerAngles( SKTransformNodeRef ref, vector_float3 euler )
```

### Apple documentation

[SKTransformNode](#)



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## SKTransition

### Functions

Create

```
SKTransitionCrossFadeWithDuration( CTimeInterval duration ) = SKTransitionRef
SKTransitionDoorsCloseHorizontalWithDuration( CTimeInterval duration ) = SKTransitionRef
SKTransitionDoorsCloseVerticalWithDuration( CTimeInterval duration ) = SKTransitionRef
SKTransitionDoorsOpenHorizontalWithDuration( CTimeInterval duration ) = SKTransitionRef
SKTransitionDoorsOpenVerticalWithDuration( CTimeInterval duration ) = SKTransitionRef
SKTransitionDoorwayWithDuration( CTimeInterval duration ) = SKTransitionRef
SKTransitionFadeWithColor( ColorRef col, CTimeInterval duration ) = SKTransitionRef
SKTransitionFadeWithDuration( CTimeInterval duration ) = SKTransitionRef
SKTransitionFlipHorizontalWithDuration( CTimeInterval duration ) = SKTransitionRef
SKTransitionFlipVerticalWithDuration( CTimeInterval duration ) = SKTransitionRef
SKTransitionMoveInWithDirection( SKTransitionDirection direction, CTimeInterval duration ) = SKTransitionRef
SKTransitionPushWithDirection( SKTransitionDirection direction, CTimeInterval duration ) = SKTransitionRef
SKTransitionRevealWithDirection( SKTransitionDirection direction, CTimeInterval duration ) = SKTransitionRef
SKTransitionTransitionWithCIFilter( CIFilterRef filter, CTimeInterval duration ) = SKTransitionRef
```

Pausing

```
SKTransitionPausesIncomingScene( SKTransitionRef ref ) = Boolean
SKTransitionSetPausesIncomingScene( SKTransitionRef ref, Boolean flag )
SKTransitionPausesOutgoingScene( SKTransitionRef ref ) = Boolean
SKTransitionSetPausesOutgoingScene( SKTransitionRef ref, Boolean flag )
```

### Apple documentation

[SKTransition](#)



## SKUniform

---

### Functions

#### Create

```
SKUniformWithName( CFStringRef name ) = SKUniformRef
SKUniformWithNameFloat( CFStringRef name, float n ) = SKUniformRef
SKUniformWithNameTexture( CFStringRef name, SKTextureRef texture ) = SKUniformRef
```

#### Info

```
SKUniformName( SKUniformRef ref ) = CFStringRef
SKUniformType( SKUniformRef ref ) = SKUniformType
```

#### Value

```
SKUniformFloatValue( SKUniformRef ref ) = float
SKUniformSetFloatValue( SKUniformRef ref, float value )
SKUniformTextureValue( SKUniformRef ref ) = SKTextureRef
SKUniformSetTextureValue( SKUniformRef ref, SKTextureRef texture )
```

#### Properties

```
SKUniformMatrixFloat2x2Value( SKUniformRef ref ) = matrix_float2x2
SKUniformMatrixFloat3x3Value( SKUniformRef ref ) = matrix_float3x3
SKUniformMatrixFloat4x4Value( SKUniformRef ref ) = matrix_float4x4
SKUniformVectorFloat2Value( SKUniformRef ref ) = vector_float2
SKUniformVectorFloat3Value( SKUniformRef ref ) = vector_float3
SKUniformVectorFloat4Value( SKUniformRef ref ) = vector_float4
```

#### Type methods

```
SKUniformWithNameMatrixFloat2x2( CFStringRef name, matrix_float2x2 value ) = SKUniformRef
SKUniformWithNameMatrixFloat3x3( CFStringRef name, matrix_float3x3 value ) = SKUniformRef
SKUniformWithNameMatrixFloat4x4( CFStringRef name, matrix_float4x4 value ) = SKUniformRef
SKUniformWithNameVectorFloat2( CFStringRef name, vector_float2 value ) = SKUniformRef
SKUniformWithNameVectorFloat3( CFStringRef name, vector_float3 value ) = SKUniformRef
SKUniformWithNameVectorFloat4( CFStringRef name, vector_float4 value ) = SKUniformRef
```

### Apple documentation

[SKUniform](#)



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## SKVideoNode

### Functions

Create

```
SKVideoNodeWithFileName( CFStringRef name ) = SKVideoNodeRef// macOS 10.11+  
//SKVideoNodeWithAVPlayer( AVPlayerRef player ) = SKVideoNodeRef  
SKVideoNodeWithURL( CFURLRef url ) = SKVideoNodeRef// macOS 10.11+  
SKVideoNodeWithCoder( CoderRef coder ) = SKVideoNodeRef// macOS 10.10+
```

Visual properties

```
SKVideoNodeAnchorPoint( SKVideoNodeRef ref ) = CGPoint  
SKVideoNodeSetAnchorPoint( SKVideoNodeRef ref, CGPoint pt )  
SKVideoNodeSize( SKVideoNodeRef ref ) = CGSize  
SKVideoNodeSetSize( SKVideoNodeRef ref, CGSize size )
```

Playback

```
SKVideoNodePlay( SKVideoNodeRef ref )  
SKVideoNodePause( SKVideoNodeRef ref )
```

### Apple documentation

[SKVideoNode](#)



## SKView

### Dialog Event

#### Event

`_skViewShouldRenderAtTime`

#### Description

Specifies whether the view should render at the given time.  
Call `fn SKViewEventTime` to retrieve the current time.  
Call `SKViewEventSetBool( _false )` to skip the update.

macOS 10.12+

```
SKViewEventSetBool( Boolean flag )// macOS 10.12+
SKViewEventTime = CTimeInterval// macOS 10.12+
```

### Functions

```
SKViewWithTag( NSInteger tag ) = SKViewRef
SKViewExists( NSInteger tag ) = Boolean
```

Display scene

```
SKViewScene( NSInteger tag ) = SKSceneRef
SKViewPresentScene( NSInteger tag, SKSceneRef scene )
SKViewPresentSceneTransition( NSInteger tag, SKSceneRef scene, SKTransitionRef transition )
```

Timing of rendering

```
SKViewIsPaused( NSInteger tag ) = Boolean
SKViewSetPaused( NSInteger tag, Boolean flag )
SKViewPreferredFramesPerSecond( NSInteger tag ) = NSInteger// macOS 10.12+
SKViewSetPreferredFramesPerSecond( NSInteger tag, NSInteger framesPerSecond )// macOS 10.12+
```

Performance related toggles

```
SKViewIgnoresSiblingOrder( NSInteger tag ) = Boolean
SKViewSetIgnoresSiblingOrder( NSInteger tag, Boolean flag )
SKViewShouldCullNonVisibleNodes( NSInteger tag ) = Boolean// macOS 10.10+
SKViewSetShouldCullNonVisibleNodes( NSInteger tag, Boolean flag )// macOS 10.10+
SKViewAllowsTransparency( NSInteger tag ) = Boolean// macOS 10.10+
SKViewSetAllowsTransparency( NSInteger tag, Boolean flag )// macOS 10.10+
SKViewIsAsynchronous( NSInteger tag ) = Boolean
SKViewSetAsynchronous( NSInteger tag, Boolean flag )
```

Visual stats for debugging

```
SKViewShowsFPS( NSInteger tag ) = Boolean
SKViewSetShowsFPS( NSInteger tag, Boolean flag )
SKViewShowsNodeCount( NSInteger tag ) = Boolean
SKViewSetShowsNodeCount( NSInteger tag, Boolean flag )
SKViewShowsDrawCount( NSInteger tag ) = Boolean
SKViewSetShowsDrawCount( NSInteger tag, Boolean flag )
SKViewShowsQuadCount( NSInteger tag ) = Boolean// macOS 10.10+
SKViewSetShowsQuadCount( NSInteger tag, Boolean flag )// macOS 10.10+
SKViewShowsPhysics( NSInteger tag ) = Boolean// macOS 10.10+
SKViewSetShowsPhysics( NSInteger tag, Boolean flag )// macOS 10.10+
SKViewShowsFields( NSInteger tag ) = Boolean// macOS 10.10+
SKViewSetShowsFields( NSInteger tag, Boolean flag )// macOS 10.10+
```

Convert between view and scene coordinates

```
SKViewConvertPointFromScene( NSInteger tag, CGPoint pt, SKSceneRef scene ) = CGPoint
SKViewConvertPointToScene( NSInteger tag, CGPoint pt, SKSceneRef scene ) = CGPoint
```

Snapshot nodes to texture

```
SKViewTextureFromNodeCrop( NSInteger tag, SKNodeRef node, CGRect crop ) = SKTextureRef// macOS 10.10+
SKViewTextureFromNode( NSInteger tag, SKNodeRef node ) = SKTextureRef
```

### Apple documentation

[SKView](#)



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## SKWarpGeometry

### Functions

Create

```
SKWarpGeometryInit = SKWarpGeometryGridRef// autoreleased  
SKWarpGeometryGridWithColumns( NSInteger columns, NSInteger rows ) = SKWarpGeometryGridRef  
SKWarpGeometryGridWithSourcePositions( NSInteger columns, NSInteger rows, vector_float2 *sourcePositions,  
vector_float2 *destPositions ) = SKWarpGeometryGridRef// macOS 10.13+  
SKWarpGeometryGridWithCoder( CoderRef coder ) = SKWarpGeometryGridRef
```

Size

```
SKWarpGeometryNumberOfColumns( SKWarpGeometryGridRef ref ) = NSInteger  
SKWarpGeometryNumberOfRows( SKWarpGeometryGridRef ref ) = NSInteger  
SKWarpGeometryVertexCount( SKWarpGeometryGridRef ref ) = NSInteger
```

Vertices

```
SKWarpGeometryDestPositionAtIndex( SKWarpGeometryGridRef ref, NSInteger index ) = vector_float2  
SKWarpGeometrySourcePositionAtIndex( SKWarpGeometryGridRef ref, NSInteger index ) = vector_float2  
SKWarpGeometryByRepacingDestPositions( SKWarpGeometryGridRef ref, vector_float2 *destPositions ) =  
SKWarpGeometryGridRef  
SKWarpGeometryByRepacingSourcePositions( SKWarpGeometryGridRef ref, vector_float2 *sourcePositions ) =  
SKWarpGeometryGridRef
```

### Apple documentation

[SKWarpGeometry](#)